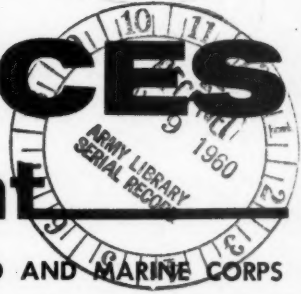


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May, 1960/\$1

# ARMED FORCES management

PUBLISHED FOR THE ARMY, NAVY, AIR FORCE, COAST GUARD AND MARINE CORPS



ASC's Gen. Warren . . .

## A Team Approach to Contract Pricing

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MAY 1960

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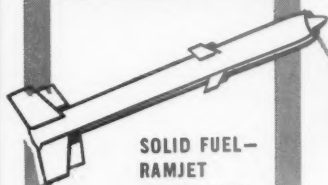


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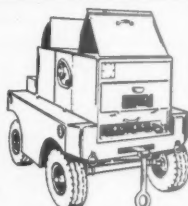
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ARMED FORCES MANAGEMENT

MAY 1960



# ARMED FORCES management

PUBLISHED FOR THE ARMY, NAVY, AIR FORCE, COAST GUARD AND MARINE CORPS

MAY, 1960

Volume 6—No. 8

## FEATURES

### The Team Approach to Contract Pricing ..... 18



There is probably no more important phase of procurement of military hardware than that of getting an honest, reasonable contract price. At Air Materiel Command's Aeronautical Systems Center, where programs managed add up to some \$6-billion a year, the importance of this is fully realized. To meet this challenge, ASC is working hard to develop a system of pricing—and the people to man it—that will give the Air Force the best possible pricing deal available. This is how the team approach to pricing works, and how ASC is going about training the negotiators it needs.

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## FEATURED NEXT MONTH

*Industrial Security: What are We Trying to Protect? . . . Contract Management—By Exception . . . Why Work Measurement?*

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**Multi-Use  
Automated  
Maintenance**

# MPTE



The recent demonstration of multi-purpose test equipment (MPTE), developed by RCA under a series of Army Ordnance contracts, highlights *a new dimension in automated multi-use systems support* and culminates a long-term RCA effort in this field. This General Evaluation Equipment is an automated, transistorized, dynamic check-out system. It contains a completely modularized array of electronic and mechanical

evaluation equipment, capable of checking a variety of electromechanical devices, ranging from radar subassemblies to missile guidance computers. MPTE provides the stimuli, programming, control, measurement and test functions for the NIKE AJAX, NIKE HERCULES, LACROSSE, HAWK and CORPORAL missile systems and has been extended to other weapons systems related to our defense efforts.



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**RADIO CORPORATION of AMERICA**

DEFENSE ELECTRONIC PRODUCTS

CAMDEN, NEW JERSEY

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MAY 1960

# Common Sense—Who Needs It?

SOME time ago, L. F. Urwick wrote, in a book called "Leadership in the Twentieth Century," that "because foresight is required, the leader has always to be doing two apparently incompatible things. He has to encourage his administrators to promote order, to maintain established routines. At the same time he has to protect from their wrath the originals, the inventors, the 'crazy' people to whom order is anathema and an established routine a challenge to change it—because it is from this lunatic fringe that he is most likely to derive something original.

"This conflict is one of the great paradoxes of leadership—the source of some of its great difficulties and the reason why we cannot do without it. The business that cannot resolve it will either go bankrupt tomorrow because it is too disorganized to get out the goods, or in five years' time because it is still trying to sell the same goods. This paradox, this conflict is reproduced to some degree all down the line, wherever people exercise authority over others. It is the world conflict between technical progress and social custom."

Urwick, we submit, was a little off base. It is not the lunatics that come up with the new ideas. In Defense, improvements come, mostly, from a comparative handful whose sense of logic is so abrasively insulted by dogma that they fidget, complain and crusade until the pain is relieved. The Pentagon has barely pecked at the surface in putting this vast common sense resource to work improving the way it goes about its business.

Work simplification—an organized effort to make it easier for employees, staff members, subordinates to use effectively their own innate common sense—*could* provide a healthy share of the answer.

It may not be as sexy as building a new missile but the immediate dollar savings, the vast jump certain to come in officer and civilian morale, and the whole wide spectrum of other rewards would make at least as significant a contribution to national defense. Point is something must be *done* about the idea—a suggestion too many of us seem inclined to leave to the other guy's initiative.

Best analogy: private industry. Although their standard, the profit and loss statement, is somewhat different from the "how much insurance are we buying" standard used by the military, the results would be the same—and industry's results are fantastic.

Item: Texas Instruments, Inc., which reportedly has one of the best coordinated efforts around, estimates it saved more than \$3.6 million in less than six years, including more than \$1-million during 1959.

Item: Detroit Edison Company figures its savings over the last five years at more than \$1-million annually.

Item: The Chesapeake and Ohio Railway Company says its \$2-million in direct cost reductions during the program were, in fact, dwarfed by the savings in planned capital expenditures which work simplification projects proved unnecessary. Other companies getting the same results include such industrial giants as American Machine and Foundry, Burroughs Corp., Chance Vought Aircraft, Inc., Dow Chemical Company, B. F. Goodrich Company, Lockheed Aircraft, Proctor and Gamble, Republic Steel, and the Youngstown Sheet and Tube Company.

Where less than a dozen firms were toying with the idea 20 years ago, today more than 500 companies are using some form of work simplification. The company goal invariably: boost productivity, chop costs and improve product quality simply by exploiting the plain common sense of employees at all levels.

Said one industrial engineering consultant, "the general indifference of employees is the big reason for the high costs and lousy product quality now troubling so many people. You don't improve the situation by threatening employees or forcing changes on them. And merely offering financial rewards often stirs up discord. To get people to accept changes and improvement, you have to recognize the human relations problems involved."

Example: C. (Sarge) Simmons, foreman in the final assembly on Chance Vought's Crusader jet and a Marine Corps master sergeant for twenty years. Says Simmons, "I'm probably as hard-headed as anyone, and I really gave those work simplification guys a bad time at first. Frankly, I thought the whole idea was a waste of time and money. But I've sure done an about face. When I found that some simple ideas helped me build a better airplane in a lot less man hours, it really opened my eyes. Now, if I or my men come up with a better way to do anything, I put it to work."

Such a simple thing: "do it the smart way, not the hard way." There are plenty of places around the country, like Texas Instruments, with the experience and willingness to provide advice on how to set up one of these programs. But it's an even-odds bet there are those among us in authority now, mesmerized by the present routine, who will manufacture all sorts of objections to getting off our seats and doing something.

Most of us have a desire to succeed, both personally and as a part of the nation's international police force. Problem is, are there any of us with enough gumption to try one of the simpler ways to manage that goal—even if it is over the parochial perturbations (we only suspect) of somebody higher up.

**Bill Borklund**

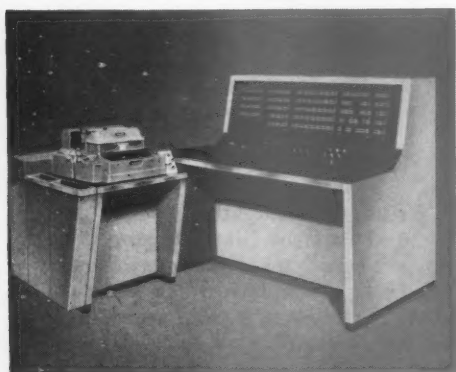




**The Univac Scientific computer** is used to simulate and prove the projected design of new systems. This concept of mechanized design, which may be described as the use of one computer to build another, eliminates prototype building and attains a degree of reliability once regarded as only theoretically possible.



**A technician follows the wiring diagram** produced by the Univac Scientific. This application of mechanized design greatly facilitates the production of reliable automatic data processing equipment.



**A significant achievement of mechanized design is the BOGART computer**, produced by Remington Rand Univac, for the U.S. Navy. Intensive preliminary testing of the projected system made it possible to reduce the size of the computer while materially increasing its reliability through the use of transistors and printed circuitry.

From the REMINGTON RAND UNIVAC

# Military Division

*Mechanized Design Dramatically Speeds Development and Increases the Reliability of New Data Processing Systems*

Remington Rand Univac was the first to apply the concept of mechanized design to computer development. By using the Univac Scientific computer, the design of a projected system can be fully simulated and proved—thus avoiding the expensive, time-consuming process of prototype building.

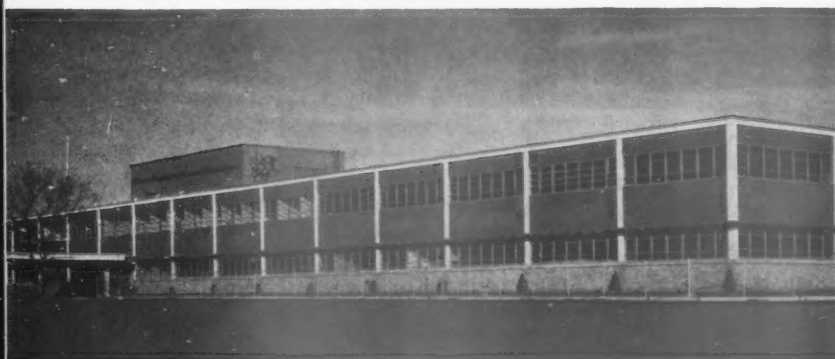
This important technique has already made indispensable contributions to the development of such systems as the Univac LARC and Athena and the Univac Advanced Navy computer. Mechanized design has significantly aided Univac scientists and engineers in attaining the farthest limits of reliability, even under the most demanding environmental conditions.

The Military Division's tradition of excellence is firmly established by a distinguished series of defense systems. Mechanized design is another example of the outstanding capabilities

which Remington Rand Univac can bring to bear on the development and production of complex computer equipment for military applications.



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**BOMARC** Computer for the U. S. Air Force Target Intercept Program  
**SEA SURVEILLANCE SYSTEM FOR THE U. S. NAVY**  
**AN/USQ-20** (Advanced Computer for the U. S. Navy)  
Additional information describing capabilities and experience or career opportunities may be obtained by writing to Remington Rand Univac at the above address.

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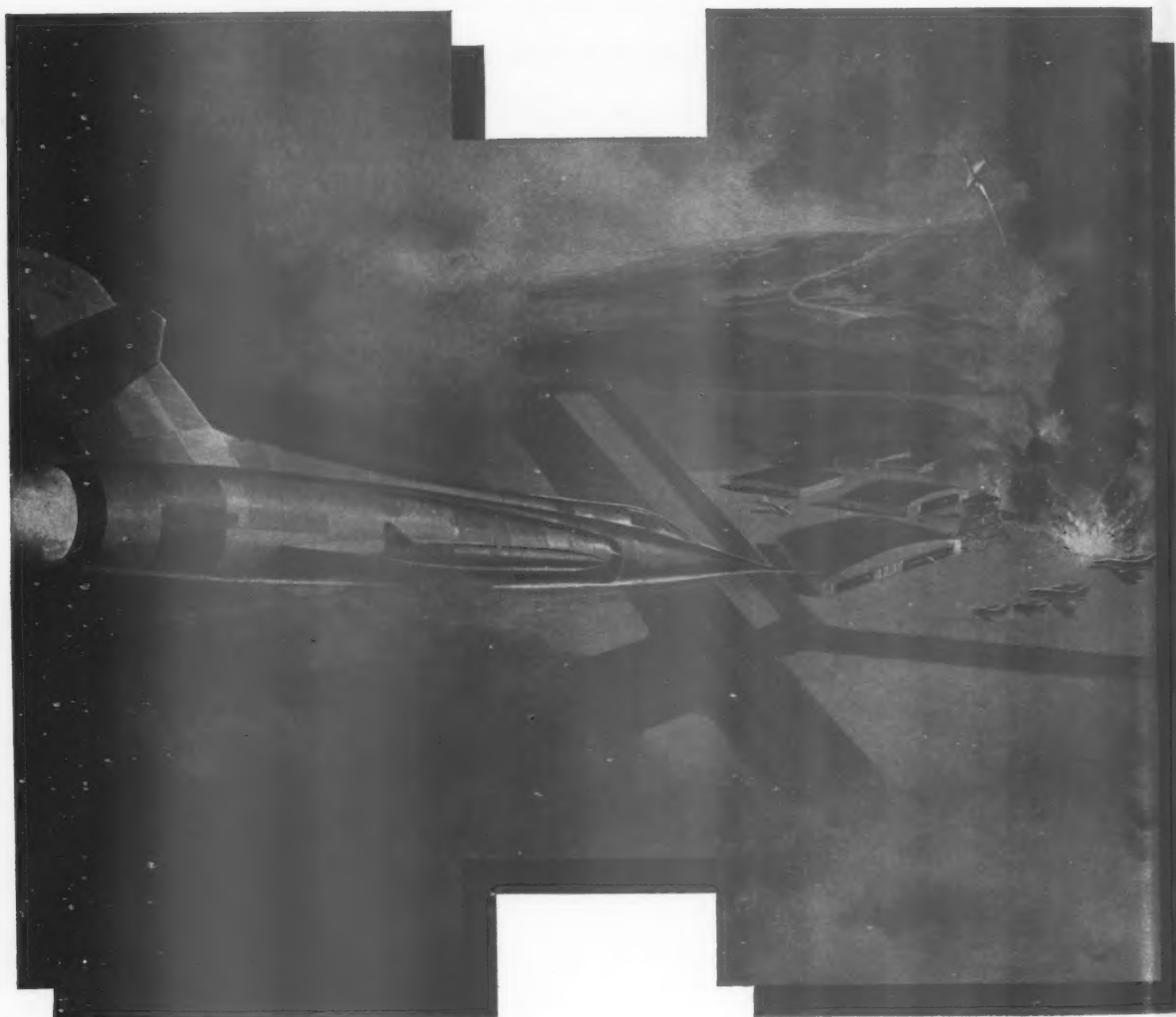
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## HYDRAULIC POWER

MAY 1960

# How to radically increase tactical missile



The new  
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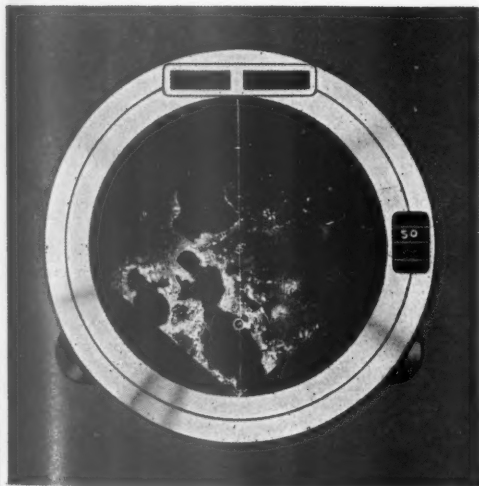
The new Hughes TARAN system is the optimum solution to the all-weather tactical mission problem! Here's what TARAN (Tactical Attack Radar and Navigator) offers:

1. A radar system with several times the azimuth and range resolution of current radars! Result: targets are more easily recognized and identified — terrain features are more readily identified and all-weather, low altitude pilotage is simplified.
2. A unique Navigational Display System which gives precise and continuous position indication and provides for blind pilotage directly to the target.
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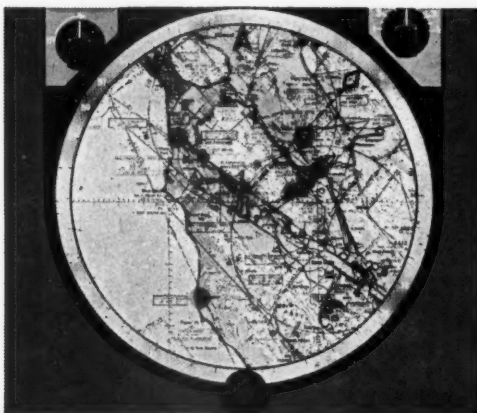
4. A unique single channel radar signal processor — providing simplicity, reliability, and easy maintenance.
5. Human-engineered displays and controls for greater safety and ease of operation.
6. Attack modes which can accurately deliver any desired armament.
7. A system which is low in weight and small in volume...and easily maintained in the field.
8. A low initial cost and a low maintenance cost!

Equally important, this system is backed by extensive Hughes experience in developing and manufacturing over 16,000 reliable, high-performance all-weather interceptor systems.

TARAN is now ready to satisfy today's most critical tactical mission requirements! For information please contact: HUGHES, ADVANCED PROGRAM DEVELOPMENT, Culver City, Calif.



The display above furnishes radar information as a navigational check against the moving map display (right). In this way, it is possible to navigate directly to target in all kinds of weather!



The Moving Map Display provides the pilot with continuous position and course information. At each designated check point during the mission, the system automatically checks the map position against the radar display and makes the necessary flight corrections.

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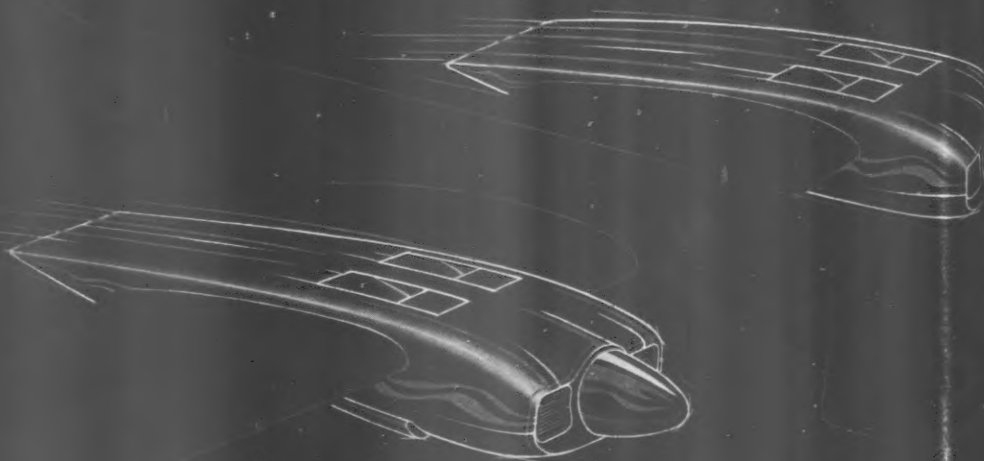
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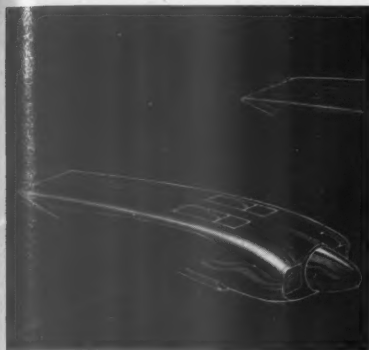
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## **In My Opinion**

### **Stay Even or Lose?**

I have been impressed to read in the March issue of **ARMED FORCES MANAGEMENT** your very perceptive article on "Today's Military Strategy: Is It National Suicide?" You have carried your analysis of massive retaliation to the logical question which it poses.

Let me try to take you one step further in your strategic thinking.

The entire concern of your article and the entire concern of our present national strategy is to maintain a military posture which will effectively deter or defeat Communist military aggression. You have only to state this objective to perceive its inadequacy. It is purely defensive and embraces no initiative against the enemy. It is based upon a severely restricted definition of war as the clash of formal military forces. It accepts the free world as the arena of conflict, and leaves the Communist world unchallenged by any movement for freedom. In these terms of conflict, the West can only stay even or lose; the Communists can only stay even or win. The destruction of the Free World is inevitable.

The people of America and of Britain do not understand nor value freedom. You will find the people who value freedom behind the Iron Curtain. The West did not believe the East Berlin riots and the Poznan riots and the Hungarian revolt could occur. They still have not learned the lesson that when the Russian and Chinese people revolt against the Communist dictatorships, their armies will side with the people as the Communist-trained Hungarian Army did.

In the period after World War II, when the U.S. with the atom bomb held such superiority of military power as has never before been held by any nation in the history of the world, the West had the basis for a strong diplomatic initiative. In this period, it accepted willy-nilly the destruction of the democratic governments in Poland and Hungary, the loss of Czechoslovakia, the loss of China, the loss of Tonkin-China. In this period of Communist military weakness, Communism took the diplomatic offensive and was handsomely rewarded. All this was possible because of the negative, passively defensive policy of the West. In the struggle between free peoples and the Communist tyranny, military power cannot correct a failure of purpose.

The West must recognize that it is engaged in a life and death struggle. If it does not accept as its objective the destruction of Communist power in

the world, it will itself be destroyed. Tyranny cannot stand freedom. We see and understand this when Castro leads the Cuban people to overthrow Batista. We do not see that this is possible in the Soviet Union and in China. So, we lend our policy to building prestige for the existing Communist regimes by continuous negotiation which supports and enhances their domestic positions. We should be using our international position and power to destroy and discredit those regimes and to free their people.

There should be no revolution in the satellite countries. Revolution must occur in the Soviet Union where the Soviet Army cannot be employed against the people.

I am discouraged about the present preoccupation of our leading writers on national strategy with purely defensive concepts of military strength. The Free World can win its struggle with communist tyranny without war, but it cannot win it without offensive strategy.

*Maj. Gen. T. A. Lane*

Commanding General  
Fort Leonard Wood, Mo.

#### **Discussion Needed**

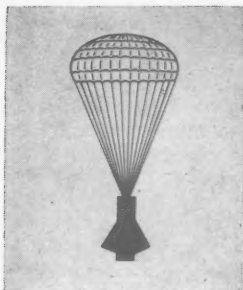
In response to the lead article in this month's **ARMED FORCES MANAGEMENT**, "Today's Military Strategy: Is It National Suicide?," let me say that I believe that complex as the national defense issue is it deserves the most extensive discussion by Congress as well as by the public.

Judging from letters from my constituents and my own discussion with many New Yorkers, I do not believe that as yet a convincing case has been made to the people that substantial increase in the defense budget is the answer to the question of how we can meet any unusual emergencies during the period of the early '60's. However, if that case is made, as a Senator I will unhesitatingly vote for more money and I believe that the great majority of my colleagues will do so.

As a member of the Subcommittee on National Policy Machinery of the Senate Committee on Government Operations, I have participated in the current series of hearings. I believe they are making a most significant contribution to our knowledge of how policies affecting national security are determined, which is basic to any effort to streamline procedures which will further strengthen U.S. defenses.

*Jacob K. Javits*

Senator from New York



Putting an astronaut in orbit is only the beginning. Vitro, through its Nems-Clarke division, is supplying all ground r.f. telemetry equipment for Project Mercury. Purpose: to receive and record 68 different signals at 17 tracking stations around the world — telling specialists on earth how man and equipment react to conditions in space. Another example why Vitro means more than atomic energy...**space electronics.**

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IN  
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## Washington Background

**ATTEMPT TO MAKE GAO'S MANY REPORTS USEFUL** has resulted in forming of a new office, titled Management Evaluation Division, under the Defense Comptroller. Aim of the office, headed by J. S. Hoover, will be to evaluate GAO recommendations, see that, where reasonable, they are followed on a uniform basis. Fringe benefit: in telling people to follow GAO suggestions, the new office must necessarily sort out much of the chaff. Formerly, most follow-ups were left almost entirely to the discretion of the local commander under the gun.

**"AGGRESSIVE USE OF INTERSERVICE SUPPORT"** facilities received a shot in the arm from Defense Secretary Gates last month in a note, later made public, to all three Services. His highly significant, but little publicized, comment reportedly resulted from an Air Force proposal to cancel or drastically cut medical air evacuation services. The implied point: Services should cease viewing their executive agent or single manager responsibilities as one of the first places to squeeze when they need dollars.

**SOME DEFENSE OFFICIALS ARE CONSIDERABLY CHAGRINED** with U.S. diplomats' elation over "breakthrough" in negotiations with Russians about nuclear disarmament. Reason: Soviet offer to voluntarily cease testing of small weapons can seriously cripple our ability to overcome future communist numerical superiority with tactical nuclear equipment, doesn't cost them a thing in military strength they don't already possess with conventional forces.

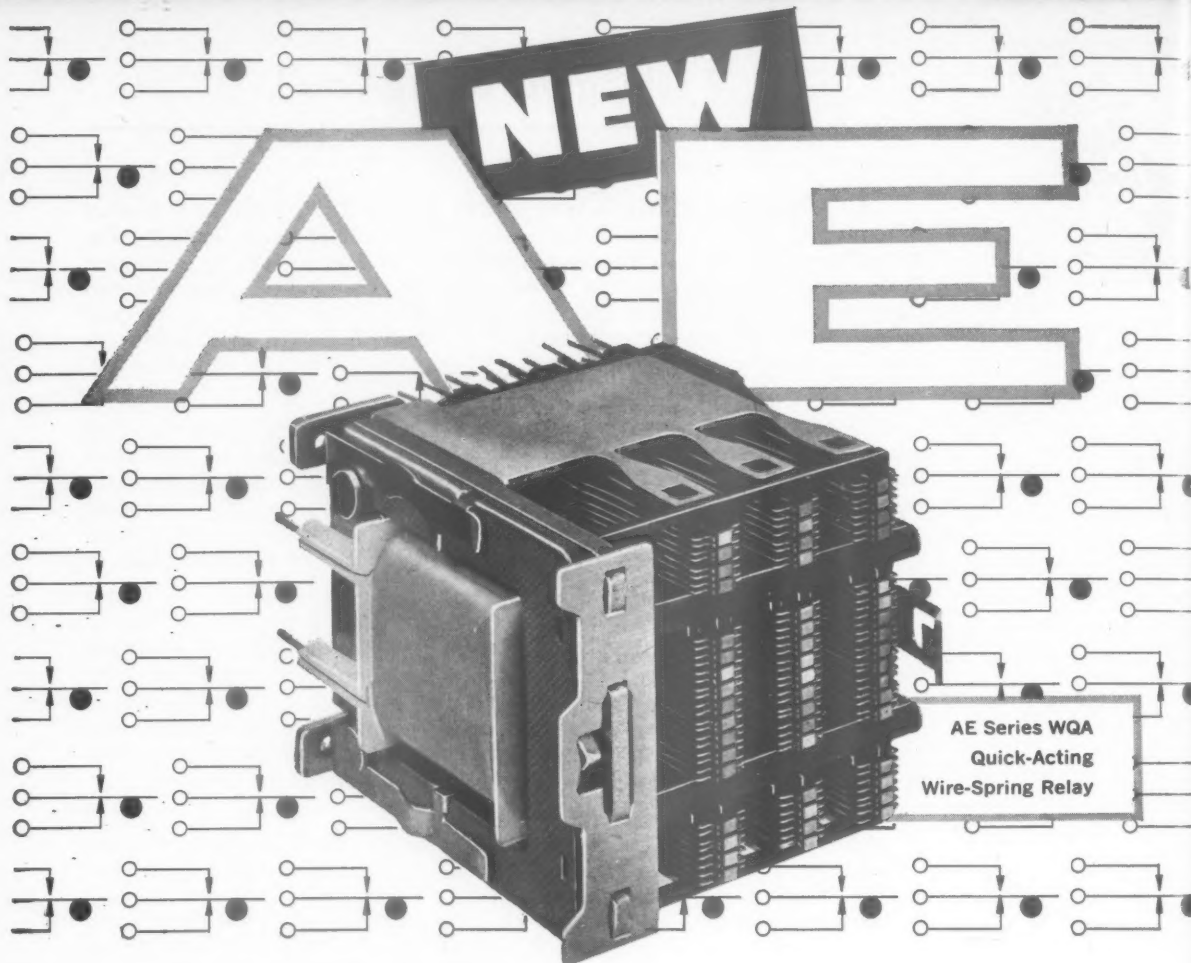
**MILITARY AIR TRANSPORT SERVICE FUTURE** continues to look brighter each day, at least on Capitol Hill. Leading the crusade to beef up MATS: Mendel Rivers' House Armed Services Airlift subcommittee. Besides suggesting he may recommend MATS be made a specified command under the Joint Chiefs (to free it from the tug of war between civil aviation and Air Force itself), Rivers has called for an immediate appropriation of \$50 million to develop an "uncompromised" cargo aircraft—an "obvious need."

**TREND TO INTERNATIONAL SUPPLY LINES**, transceiver networks and electronic data processing to speed pipeline supply delivery world-wide has opened speculation in some circles that Military Traffic Management Agency's authority may be expanded on the same basis, i.e. outside continental U.S. limits. Likelihood at the moment: slim. Idea's advantages: avoiding real or possible duplication of network facilities.

**SPEAKING OF SUPPLY DELIVERY, A FEW INDUSTRY EXPERTS** who have helped set up these systems have wondered privately why punched cards carry no traffic data. Cards have room for it but, reportedly, in no system do supply networks take advantage of this additional step toward automation—the ultimate goal of all these systems.

**BRITAIN'S ANNOUNCED ABANDONMENT OF BLUE STREAK**, major missile weapon in her nuclear armory, has raised questions among a few U.S. military planners. Stated reasons included economy and vulnerability of launch sites. But, in light of current series in this magazine, British, in soul searching required to come to their conclusions, realized that missile is not, in fact, the deterrent against mobile strategic force it is credited with being.

**HOUSE "OFFICER-HIRING" BILL PASSED LAST MONTH** appears likely to molder in Senate until year-end because of Senate's present workload, lack of "consuming interest" in digging into problem. Quick passage appears probable only if Senate decides (but it's not likely) to accept with only cursory examination the proposals of their junior brethren.



## TO THE ENGINEER who wants to transfer 51 circuits simultaneously

If you need simultaneous transfer of a large number of circuits without fail, take a look at AE's new WQA relay. It will do the work of four or more heavy-duty, general-purpose relays each with maximum spring pile-ups, and sustain 50 million or more operations without readjustment.

In the WQA relay, all moving springs pass through holes in a unique actuating "card." Moved directly by the armature, the card in turn actuates all the moving springs. This method of operation pre-establishes exact timing and sequence of all spring operations, and at the same time assures perfectly syn-

chronized "break-before-make" on all circuits. Contact capacities on WQA relays can be custom-tailored to your needs, with either one, two or three levels of contact assemblies available, each with a capacity of 17 Form C combinations. Other Forms available.

Our circuit engineers will be pleased to work with you in adapting the WQA to your specific design. Or, if you wish, they'll take on the complete packaging job.

If you'd like more information on the WQA relay, address your request for Circular 1957 to: Director, Control Equipment Sales, Automatic Electric, Northlake, Illinois.

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### CRASH PROGRAMS CRITICIZED

"Millions of dollars, valuable scientific and engineering effort and much precious time" can be poured down the drain by concentrating too early on flight testing of missile systems, according to Vice Adm. John H. Sides, Director of Weapon Systems Evaluation Group.

Sides said that the idea of building reliability into a missile as late as the production phase has proved an expensive delusion. He pointed out that "there are no tricks, no cheap ways, to easy roads. If we are to achieve true reliability, there never comes a time when design engineers can turn a job over to the production people and wash their hands of it . . . any attempt to achieve reliability as an afterthought only results in heartaches, and wasted man-hours, range time and critical dollars."

Sides pointed out that service personnel are concerned about prevailing conditions when they are called upon to fire the weapon "in anger." Missile design must insure that any component or sub-assembly can be removed and replaced quickly in the event of malfunction—preferably by simple, plug-in procedures.

The WSEG Chief said early missile delays were often caused by specifications and time scales exceeding state of the art. These, in turn, resulted in heavy cost overruns. Also accruing were critical stretch-outs and delays. "Crash engineering solutions for reliability failures have often increased complexity without getting down to the problem of finding a simpler but less apparent cure," Sides said.

In the future, he said, marginal components and sub-systems will be out of the question—complete reliability, engineered into prototype vehicles are a critical prerequisite to successful space development.

### WEAPONS POSITION DEFENDED

This country is "fully abreast" of Soviet technology to date on military weapon systems, according to Brig. Gen. A. W. Betts, director of Advanced Research Projects Agency.

Betts said, "If qualitative comparisons are made in any phase of military or space technology, current American effort points to a more intelligent use of space than our Soviet competitors have displayed to date with their more flashy firsts."

Although Betts acknowledged that Soviet rockets possess greater thrust than ours, he pointed out that this difference has forced the U.S. to design to a greater quality to make use of the thrust available.

"Optimum for any military weapon system is to have it just large enough and no larger," Betts said. In this connection, Betts cited the Minuteman missile, which will be smaller than Atlas.

He pointed out that size is related to cost, and to the amount of fuel and liquid oxygen needed, and the size of launchers and ground support equipment and related logistic support.

"In spite of the fact that the Soviet booster is about twice the size of Atlas in initial thrust, we have the hardware capability today to just about duplicate what they could do two years ago. This has been accomplished by getting the most from booster and upper stage

combinations. With the still further improved Centaur upper stage, in another year or two we will exceed anything the Soviets have done to date," Betts said.

He continued, "of course what the USSR will be doing in the meantime is anybody's guess. But it's significant that we are apparently putting much more effort into our overall space program today than they are."

### ANSER AIDS AIR FORCE

Analytic Services, Inc. (ANSER) a research study group formed two years ago, is doing an increasing amount of work for the Office of Air Force Director of Development Planning in the area of technical and weapon systems evaluations.

An off-shoot of the RAND Corp., ANSER is budgeted for \$1-million in fiscal 1961 Air Force Budget.

The small (40 scientists and professional people, plus clerical help) were initially assembled by RAND Corp., and RAND people appeared on the original Board of Directors. Air Force intends to phase out RAND/ANSER connections that now exist at an early date and already is funding ANSER separately. Heading ANSER is Dr. W. W. Lawwill.

Under study at ANSER is a cost-effectiveness comparison of strategic weapons. According to Air Force, the group is "organized to parallel the major areas in development planning. Primarily a theoretical research group, it functions with a minimum of technical equipment."

"Laboratories and elaborate computers used by other research consulting groups are de-emphasized with the thought that we can contract for occasional use of such facilities if they are needed. We are well-equipped for prompt, searching analysis of problems in any closely-defined area that needs attention."

### MISSILE RANGES CENTRALIZED

Test ranges, tracking stations and other technical facilities used in missile and space programs have been brought under central supervision and coordination in the Office of the Director of Defense Research and Engineering.

Heading the new office, with the title of Deputy Director of Defense Research and Engineering, will be Maj. Gen. Donald N. Yates, USAF, who is currently in charge of the Atlantic Missile Range, Cape Canaveral, Florida.

Effective immediately, the aim of the organizational switch is to "use national resources more effectively through the elimination of unnecessary duplication in ground stations, tracking networks and other facilities and through the over-all scheduling and planning of test programs."

Working under Yates will be Alvin G. Waggoner, with the title of Assistant Director of Defense Research and Engineering (Ranges and Space Ground Support). With a staff of six, Waggoner will provide General Yates the staff support he will need to accomplish the job.

According to one top defense official, "this is the first time we have moved into a potential problem area at this level before the problems began." It will probably be "a few months" before the office is handling all the problems it will eventually meet.



# A Team Approach To Contract Pricing

**Managing \$6-billion  
each year in contracts,  
ASC has to use  
a unique control method**

**by Captain M. A. Cramer, Jr.,  
USAF**

**E**FFECTIVE contract pricing has always been the aim of every Air Force agency buying goods and services for the government. Recently, however, items procured for government use have increased in complexity so much that a weapon system may cost millions of dollars.

The Aeronautical Systems Center (ASC) in Air Materiel Command has begun an intensive management program to meet its pricing challenge; a challenge representing about five billion dollars a year.

As Commander of ASC, Maj. Gen. Beverly H. Warren has personally supported and guided ASC's effort to improve pricing performance. In September 1958 a Pricing Office was formed within ASC's Directorate of Contract Support. It was then that Col. Albert W. James, Director of Contract Support, identified certain objectives needed to improve pricing work. Among the objectives:

(1) A more fully developed approach to pricing management. (2) Greater emphasis on planned participation by field personnel in negotiation. (3) Research toward better pricing and estimating techniques, and (4) Uniform pricing concepts and practices throughout ASC.

In July 1959, with continued management stress on quality pricing, ASC centralized pricing functions under Col. Frank E. Oliver. Centralization involved moving price analysts from several Government Furnished Aeronautical Equipment (GFAE) buying divisions to the Pricing Division. It formerly employed only analysts who supported Weapon System Project Offices in pricing large dollar airframe and missile procurement.

The decision to centralize ASC pricing anticipated the following management improvements:

(1) More uniform pricing policies, procedures and actions; (2) Timelier, more effective pricing; (3) Better scheduling and use of pricing personnel; (4) More intensive training and improved skill for pricing personnel.

Also, (5) Uniform special item treatment; and (6) In general, management able to exercise responsibilities in planning, organizing, directing and controlling the ASC pricing effort in the most expeditious, effective manner.

Col. Oliver set for himself and his division the primary aim of continual long run improvement in pricing quality while maximizing efforts to improve present quality. Problems had to be identified. With this identification, basic ideas on pricing improvement had to be refined and disseminated.

The basic problem areas were isolated. Immediate action began to attack these problems, basically in the

following areas: (1) Organization; (2) Personnel (quality and quantity) and training; (3) Management control and review of pricing action; (4) The basic approach to quality pricing; and, (5) The team concept.

Now let's see what ASC has done—and is doing—to combat these problems and improve pricing performance.

First the Pricing Division was reorganized to better match organization and function. Under the change, the Price Analysis Branch is responsible for actively participating with and supporting all ASC buying activities in price analysis and negotiations. The Branch has four operating groups, with the flexibility of added groups when needed. Each group has four or five price analysts plus clerical support. The group leaders, military and civilian, are price analysts selected for ability, seniority and experience. They act as consultants to price analysts under them, aid as required, and insure that each price analyst is providing optimum support to buyers.

The Pricing Data and Evaluation Branch presents a new and different attack on the pricing problem. This branch continually researches better pricing techniques; collects, maintains, and evaluates pricing source information; and performs industrial engineering and pricing studies on request. It maintains all pricing case and source files for the Pricing Division.

In short, Pricing Data and Evaluation Branch uses the myriad of available cost data to obtain better prices. When fully manned it will have price analysts, industrial engineers and mathematical and analytical statisticians.

With full support from local personnel offices, the Pricing Division has started an intensive recruiting and training program. The Division had, immediately after centralization, seventeen price analysts. Since then, twelve trainees have been added.

The recruits are from various sources—military men with procurement or audit experience, and civilians with similar backgrounds. Concurrently, all price analysts on board were screened for training needs. Profile cards are kept on each man, outlining experience and schooling, and spotting need for further on-the-job training or formal schooling.

Air Force has three schools available to selected personnel: a fourteen week pricing course conducted by Harbridge House under a government contract; a basic 8-weeks Pricing Course; and a 4-weeks Advanced Pricing Course, both offered by Air Force Institute of Technology. Of 29 analysts and trainees, eleven have attended one or more of these schools and thirteen will attend this year.

## TRAINEES SCHEDULE

MONTH	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
WEEK OF	5 12 19 26	2 9 16 23	30 7 14 21 28	4 11 18 25	1 8 15 22	29 7 14 21 28	4 11 18 25	2 9 16 23	30 6 13 20 27
CRAWFORD	PHASE III & IV	PHASE III & IV WEINSTEIN	PHASE V RES	PRICING SCHOOL		PHASE VI SOPER	F-101 1 FIN	CN 1 FIN	H-43 1 FIN
REEL	PHASE I SOPER	PHASE II WEINBERG	PHASE III WEINBERG	PHASE V LEBEDOW	PHASE V L & WEINSTEIN	PHASE V WEINSTEIN	PRICING SCHOOL		

## WSPO's SCHEDULE

MONTH	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
WEEK OF	5 12 19 26	2 9 16 23	30 7 14 21 28	4 11 18 25	1 8 15 22	29 7 14 21 28	4 11 18 25	2 9 16 23	30 6 13 20 27
WEINSTEIN	GAR 3A - 11 & 4 INIT FLT TEST		LEAVE	1M 99 34 C	1M 99 SA 2 2 INIT	1M 99 2 L/C	LEAVE		
SOPER	GAM & 3 DEV TRNG			CO. ARN 65 1M 76 MARTIN	T. I. GSE	HU 1 A	GAM 87	PRICING SCHOOL	Q 2 C

## EQUIP & SERVICES SCHEDULE

MONTH	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
WEEK OF	5 12 19 26	2 9 16 23	30 7 14 21 28	4 11 18 25	1 8 15 22	29 7 14 21 28	4 11 18 25	2 9 16 23	30 6 13 20 27
KROGER	PRICING SCHOOL		RES V VI	SUPER	QRC 70 CONTR	E-4 & MA-1			
WALLACH	JBM 3 H C	LEAVE	IBM RES	GE FIT CONT	L-23	ASB 1 INIT	DYNASOAR COMPONENT	PRICING SCHOOL	

Total training is in six phases. Time in each phase depends on trainee progress. An outline of the phases follows:

**Phase I—Orientation**—Office procedures, AMC and ASC organization; policies, Armed Service Procurement Regulations (ASPR), Air Force Procurement Instructions (AFPI), other applicable pricing guides.

**Phase II—Negotiation, general procedures**—As an observer sitting through price negotiations with qualified analysts.

**Phase III—Negotiation, Specific element**—Sitting through negotiations working with a specific cost element for analysis, using tools and techniques of cost evaluation.

**Phase IV—Schooling**—One of the schools mentioned earlier.

**Phase V—Complete Negotiation**—Actively participating in complete negotiations to gain detailed understanding of evaluation of all price elements.

**Phase VI—Conducting Minor Nego-**

tiations—Under a qualified analyst, conducting a full but minor negotiation.

After training, the recruit works up to more expensive negotiations and more complex procurement, in line with management's evaluation of his abilities. Col. Oliver's feeling is that, "Some of our boys can take the firing line in about six months, others may take up to nine months or a year. We won't put a man under the gun until we know that he is ready."

### The Scheduling Board

A training schedule board is maintained in the Pricing Division. A glance tells management what phase each trainee is in, and how long he will probably be in it. It also shows phases completed, and how long it took each man to get where he is. If a trainee is in a negotiating phase, the board shows which analyst he is with.

Scheduling negotiations, which to the Pricing Division means scheduling

analysts, is critical at ASC. The problem stems directly from not enough qualified analysts; which, of course, limits flexibility. ASC feels this is a short run problem which will exist only until the trainees start to pull their oars.

Maximum scheduling flexibility with resources on hand is the aim of the Pricing Division. Each ASC buying office must submit projected annual negotiation schedules to the Pricing Division each quarter. Stretch-outs, cut-backs and other program changes offer constant scheduling revisions.

Price Analysis Branch uses schedule boards to provide an up-to-date picture. Each price analyst is listed with his tentative negotiations schedule for the year. Negotiations projected beyond three months are for planning only, as changes are inevitable. Yearly scheduling does, however, provide a good feel for the future and points up potential problems.

In giving a price analyst a set time



## Insuring expert control . . .



Ultra-complex, expensive weapon systems such as the B-58 are the lot of ASC.

period for a specific negotiation, management exercises extreme care. The analyst must have enough time to assimilate, evaluate and analyze all needed cost data before prenegotiation actions and negotiations.

Besides keeping flexible and fast-reaction schedules the Price Analysis Branch must control all pricing cases the Division has in-house. These are the contractor's proposal and substantiating data, plus reports from Air Force field support agencies. This information is gleaned by ASC buying offices and sent to the Pricing Division where it goes to the analyst involved.

To control its cases, the Division has a Pricing Case Register, with detailed information on each case, such as case number, contractor, and end item description. Meat of the register is milestone data it contains, such as date received, date fact-finding completed, date of prenegotiation presentation, dollars contractor proposed, dollars negotiated, date negotiation completed, date price negotiation memo distributed, and contract type with profit arrangement described.

This information is invaluable to management. Col. Oliver comments, "The register tells us what we have, who has it, and what he is doing with it. Without this information we would be denied the basic management data imperative to the successful operation of any going concern."

A management review system was begun closely akin to 100% inspection in quality control work. Col. Oliver felt from the outset that "When quality is in doubt and quantity permits, let's look at everything." Thus, a procedure has been set requiring each analyst to make a prenegotiation presentation to the Division Chief and/or Deputy on every objective he has developed for negotiations.

This gives management several tools,

including a chance to review work quality, and ability to evaluate personnel. It also gives analysts more personal knowledge of management's pricing ideas. As demonstrated work and personnel quality increases, this management review will be used more selectively.

Pricing is not a science. Price quality cannot be set by weight of substantiating data submitted. It must be related to "What is a good cost." Determining good cost requires utmost personal judgement by those involved. Some of ASC's procurement is single source negotiated buying, with competition under Air Force System Source Selection procedures. In these procedures, without competition under solicited bids, the alternative is to develop the most effective cost estimating capability possible.

ASC believes that the only way to assure high quality pricing is to identify every action to be taken and then insure these actions are taken when they should be, in the way they should be taken, by people who should be taking them.

This, then, is the basic approach to quality pricing. It requires determination and know-how. ASC calls it "The Team Concept of Pricing."

A typical team for analyzing, evaluating and negotiating price on a given procurement would include a buying division chief; a contracting officer and buyer; ARDC project engineer; ARDC laboratory project engineer; price analyst from the Pricing Division; Industrial Facilities personnel, if appropriate; Air Force Plant Representative personnel; and Resident Auditor personnel. This would be a full Air Force team. The team concept is, briefly, full use of talents of every Air Force activity which can help arrive at a reasonable price for the job at hand.

On the team, the Pricing Division's

analyst is the expert in cost estimating. He uses such pricing help as he can from ARDC on technical matters; auditor comments on historical costs; administrative contracting officers' opinions on cost projections, buying office aid in costs, profit and contract type considerations, and so on. With these inputs, plus any available data on similar previous buys, and with every analytical tool at his disposal—comparative analyses, learning curves, cost projections—the analysts' job is to set a realistic team price objective.

To inculcate the team concept and make every member of ASC aware of his job as a team member, Pricing Division has developed and published supplements to Air Force Procurement Instructions. These outline the buying cycle, from Request for Proposal through the writing the price negotiation memo. Guidance in these supplements reflects the basic approach and the team concept described earlier.

Buying activities are given guides on the nature and extent of data they should request from AFPR and Auditor field personnel. Team composition is outlined, recognizing the potential within the activities concerned. Prenegotiation presentations to Gen. Warren and his staff are required for more important procurements.

Team responsibilities in developing prenegotiation objectives at formal team meetings are outlined. A guide is provided for setting up team members' responsibilities during negotiations. A format is prescribed for the writing of the ever important price negotiation memorandum.

As Col. James puts it, "The guidance is out, now we have to sell it and inculcate everyone with the philosophy. The words aren't perfect, they will be changed and refined, but the philosophy is there and it makes good sense. Now all we need do is bring about uniform understanding and implementation of the policy."

"Every member of the team must understand his role, and each member must appreciate the importance of his contribution and the contributions of every other member involved." This, emphasizes the Colonel, "is a prerequisite to any team effort."

ASC, from Commander on down, is making a concerted effort to improve pricing. The Center has taken a new look at its pricing effort and knows that on any team, fundamentals are the key to success. In striving to improve the quality of its pricing actions, the Center is stressing the fundamental—the basic—the team approach, and believes that it will pay dividends in the form of more equitable prices for both taxpayer and contractor.

ARMED FORCES MANAGEMENT



## CONCLUSION

# Today's Military Strategy: Is it National Suicide?

by Bill Borklund

• **IN BRIEF:** First article in this series pointed out that "massive retaliation," in the past few years, has come to mean the vengeful, city-busting slaughter of Soviet people; contended that the philosophy of "mutual suicide" might kill several million citizens on both sides of the world but it would have no effect whatsoever on the military contest; that military force must be built to destroy the opposing military force—something our national policy makers have evidently lost sight of in their quest for a cheap way to protect the U.S. from World War III.

And, what is worse, the appalling paradox is that our bargain basement military force now planned not only won't protect us from that holocaust but will assure our own destruction when it starts.

• Second article outlined why dependence on the ICBM as our predominant strategic offensive weapon bound us inextricably in this futile policy of national suicide—and the present romance with this huge bullet should be toned down considerably; also, that an airborne alert of 125 B-52's was not only extremely costly but, more important, militarily insignificant.

• This final article suggests some of the ways our planning must be revamped if we are to have a force five years from now capable of meeting the real challenge with which we will be faced. . . .

**T**HE objective of our military force must be to defeat the opposing military force. The only way to defeat that military force is to attack it. Destruction of the enemy's industrial base, urban areas, and people can neither win nor lose a war. The outcome will be decided as soon as one strategic offensive force dominates the other.

Whether or not we prepare to bomb cities is a question of policy, not of strength. Cities are the easiest targets of all. A capability to destroy people and cities is an inherent part of any modern military force designed to defeat the opposing military force.

Strategic offensive forces today are composed of aircraft and missiles. In a few years they will include earth satellites. Further in the future they will contain true spacecraft. Strategic offensive forces are the dominant element of military force. This fact is inescapable because all elements of military power are susceptible to destruction by strategic forces today.

Once an enemy's strategic offensive

←  
Measuring the true military value of today's weapon systems is the problem.

## What is needed for the future . . .

force is defeated, our force can then turn to destruction of the enemy's remaining military capability. The enemy would have no means left to prevent it. It is the consensus within the Pentagon that even the *defensive* anti-missile missile will be unable to cope with future operations of *offensive* ballistic missiles capable of launching decoys, supplying electronic countermeasures and altering course during the terminal phase of flight. Therefore, defeat of the opposing strategic offensive force is a necessary action and is certain to achieve military victory.

The ICBM has changed our blueprint for building a military force capable of achieving victory. Recognition of the capabilities and limitations of long range rockets leads to the conclusion that the principal hope for protecting a military force today lies in mobility.

The trend toward mobility as self-protection for our strategic offensive forces will change the character of future wars. But it will not change military objectives. An opposing military force cannot be defeated unless we can attack all of the enemy's strategic offensive systems. While the important fixed targets are being destroyed by aircraft and ballistic missiles, mobile forces (aircraft, submarines and missiles) must also be brought under attack. If both sides possess mobile weapons but each lacks the capability to attack mobile weapons, a stalemate ensues.

Inability to achieve dominance in general war is held by some to constitute "stable deterrence," "mutual deterrence," or "stalemate" thus prohibiting World War III.

In fact, however, this situation is far from stable, since the means for breaking the stalemate are within our grasp today. When one side possesses the capability to attack and destroy an opposing mobile force as well as fixed weapons, then a decision is possible.

At the present time only aircraft can attack other than fixed military targets within a nation. Because aircraft are the sole existing means to attack and destroy mobile forces, and because the ICBM has the undeniable capability to destroy airfields, we must take one, or preferably both, of two courses of action to protect our aircraft: (1) aircraft must be capable of infinite dispersion on the ground—they must be capable of Vertical Takeoff and Landing. (2) Aircraft must remain in the air a major part of their useful life (Aircraft Nuclear Propulsion). In the present state of the art VTOL is

limited to interceptor type aircraft due to low ratio (thrust to weight) engines while nuclear propulsion is limited to large bomber type aircraft due to engine weight, shielding, etc.

An excellent example of advance planning, and recognition of the inevitable, is demonstrated by the West German Luftwaffe which anticipates the loss of all of its airfields at the outset of a war. To maintain mobility of its aircraft and to retain its striking force against the enemy, the Luftwaffe, in cooperation with Messerschmidt, Heinkel and Rolls Royce, is presently developing a 50,000 lb. Mach 2-plus VTOL fighter. This aircraft will be far less vulnerable to long range ballistic missiles because it will not be tied to an airfield. It will takeoff or land almost anywhere, thereby increasing its chances of re-use and initial survival.

Rolls Royce, NASA and Bell Aircraft Corporation have conducted studies which indicate that a VTOL supersonic jet transport weighing 300,000 lbs. is entirely feasible. Today's highest ratio (thrust to weight) engines are about 7-1. NASA officials believe that the technology is available today to ensure the development of dependable turbojets with thrust-to-weight ratios about 10-1. This should be adequate for VTOL fighter aircraft. But, it is generally agreed that a 15-1 engine is required to guarantee an effective supersonic VTOL heavy bomber and transport. Development of such an engine would be very expensive but it is now a military necessity.

For large bombers, the most promising solution to the problem of ICBM vulnerability is Aircraft Nuclear Propulsion (ANP), which has been under development for many years. Last year,

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*\*Because of the wide-spread interest generated by this series, and because it is probably the first time that this information has been gathered in one place, AFM is making reprints of the entire series available. The series has been based on foreseeable and imagined technological advances, and, according to Air Force, the "tenets advanced will be valid for the next ten years. Implications on future military developments and strategy will be considerable." Write The Editors, ARMED FORCES MANAGEMENT, 1001 Vermont Ave., Washington 5, D.C. Price, 50¢ per reprint, bulk rates on request. Cash, check or money order must accompany each reprint request. Allow three weeks for delivery.*

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Lt. Gen. Roscoe Wilson, Air Force D/CS for Research and Development, said that with \$200-million a year for two years, we could fly a nuclear powered aircraft. General Wilson's request was cut to \$75-million annually.

Many military men were deeply disturbed by official statements that "there is no specific requirement for an ANP weapon system." These statements were equally disturbing to other leaders. Chairman John A. McCone of the Atomic Energy Commission told the Joint Congressional Committee on Atomic Energy this year that he predicts scientists will achieve nuclear propulsion of planes and rockets within 10 years. "We must not permit the pace of these developments to be dependent on firm requirements for specific (vehicles)."

Apparently McCone had a much keener appreciation of the tremendous potential of ANP to our national defense than some of our military spokesmen.

*One has only to look at the impact nuclear propulsion has had on naval warfare to recognize the potential significance of ANP to aerospace warfare.*

It is unfortunate that technical difficulty, lack of funds—forcing a program stretch-out—and an arbitrary increase in required performance have delayed the program. A specific forecast for the first nuclear-powered flight is no longer possible.

The two major deficiencies of manned aircraft—limited range and dependence on vulnerable airfields—can be eliminated with the development of ANP and VTOL, give such aerospace forces the decisive ability to survive and destroy an opposing military force.

When these forces possess ANP/VTOL, a far better defense against forces of this type will become necessary. Such a defense, besides shielding critical areas, should help eliminate the enemy's offensive force. Future defensive forces also must have dispersion (VTOL) or mobility (ANP). The present SAGE and GCI functions must be handled by ground mobile systems or, preferably, incorporated in the airborne attacking vehicle.

The recent reduction in air defense forces in favor of (in part) more Polaris, and Minuteman missiles, with acceleration of Midas and BMEWS was based, to some extent, on budget considerations. But it is also reported that the defense force reductions were actually triggered by belated recognition of their fixed-target vulnerability to the ICBM. In either case, the decision supports the basic thesis here.

In the confusion of trying to evaluate current and future weapon systems, we must remain clear about one overriding fact:

**ARMED FORCES MANAGEMENT**

Space probe reaches  
heights of over 500 miles—  
speeds of over Mach 10—  
with unprecedented reliability ...



## ... AND BRISTOL SIDDELEY SUPPLY THE POWER

One of the largest manufacturers of motive power units in the world, Bristol Siddeley Engines Limited produce the Gamma. A liquid propellant rocket engine, the Gamma powers the Saunders-Roe Black Knight, Britain's highly successful space research vehicle. An extremely reliable powerplant, the Gamma produces a total sea-level thrust of 16,400 lb (7,438 kg) and nearly 19,000 lb (8,618 kg) outside the earth's atmosphere, for a total powerplant weight of only 700 lb.

The Gamma has sent Black Knight over 500 miles into space at speeds in excess of Mach 10 with a reliability that is unprecedented. For, to date, the Gamma has never failed to fire successfully.

Since Bristol Siddeley's rocket division began work in 1946, it has developed a wide range of components. By combining these components in single or multi-chamber layouts, thrust requirements from 500 lb up to 100,000 lb can be met.



**BRISTOL SIDDELEY ENGINES LIMITED**

Bristol Aero-Industries Limited, 200 International Aviation Building, Montreal 3, Canada. Telephone: University 6-5471



**Bristol Siddeley Maybach** diesel engines power Britain's fastest express train.



**The Bristol Siddeley Orpheus** powers the Fiat G 91, NATO's light fighter.



**The Bristol Siddeley Proteus** powers the Britannia airliner.

MAY 1960

23



## Evading initial destruction . . .

*When there is little difference in technology between two forces, the military force which is significantly inferior in numbers is doomed to defeat.*

There is no bargain basement security—and this is especially true under a passively peaceful policy which gives an opponent the first strike.

Based upon what has been covered this far, we can analyze some of the present military programs to see if they contribute to a military policy of national survival and protection of the Free World or to one which leads to national suicide.

**BMEWS**—By far the most important defense requirement today is a Ballistic Missile Early Warning System so we can have available 600 SAC aircraft to fight a war rather than an ineffective 125 airborne B-52's, assuming airborne alert. Work on BMEWS and Midas should proceed with highest national priority. No other single area of defense is so important.

**ICBM's**—Although complete reliance on ICBM's is militarily unsound, there is a valid requirement for our present missile program. Our first ICBM's, which are admittedly "soft" (vulnerable), give us no more than a very small initial capability for the quick destruction of fixed military targets if these weapons evade destruction in the first enemy strike.

The effectiveness of an ICBM is dependent upon the missile's reliability, its CEP (Circular Error Probable) and yield of its warhead. Considering today's reliability, CEP and yield, the present program for dispersal and hardening decreases vulnerability of our missile force during the time period when we will have significantly fewer missiles than Russia.

But long range rockets will increase in reliability, accuracy, and yield. As missile technology progresses, hope for their survival must be transferred from hardening to mobility. Our present rocket program (except for Polaris) fails to emphasize the importance of achieving a mobile long range capability at the earliest possible date. Our mobile Minuteman must be rushed into operation as our Polaris is being rushed.

**Manned Aircraft**—We have used the manned bomber as our primary strategic system for many years—even now it represents the crutch which may see us through the critical period when the Russians enjoy a significant, but not overwhelming, ICBM advantage.

While today's manned aircraft represent the sole means of dealing with mobile strategic offensive forces, the

ICBM has effectively eliminated the airfield on which the aircraft is dependent. Thus, until we have ANP for our heavy, long range aircraft and a VTOL capability for our lighter defense aircraft we will not have the means of destroying mobile strategic forces. What will the United States do if the Soviets develop operational ANP and VTOL aircraft before we do? We will have no answer, could be forced to submit to nuclear blackmail or commit national suicide.

**VTOL/STOL**—Recently Air Force was reported to have dropped its Mach 2 VTOL fighter in favor of an STOL (Short Takeoff and Landing) plane. The reason was said to be cost and availability date. The cost of the engine to make the VTOL effective would be expensive. The STOL aircraft, which will takeoff and land on a semi-prepared 3000-ft. strip, would be cheaper and would be available to the Tactical Air Command sooner than a VTOL aircraft.

But it is doubtful that this was a wise decision. The STOL will still have the most serious limitation of our present aircraft—it will require an airbase. It is almost as easy to destroy an airbase with a 3000-ft. semi-prepared runway as it is to destroy one with a 10,000-ft. runway.

*But most important, because an STOL system is completely dependent for its effectiveness on an airfield, it is subject to wholesale destruction on the ground and should not be termed a re-usable system.*

Why spend the money on a system which, if its airfields are located in the battle zone, can be destroyed at the outset of war—even small wars? It would seemingly be wiser to spend those funds on VTOL aircraft that can survive in the nuclear age and can be used for more than one mission.

**B-70**—The proposed B-70 possesses the most serious limitations of our current manned aircraft. It does have some increased capability such as flying much faster and many thousand feet higher than other bombers. But again with no airfields, it is a one-shot weapon.

If the B-70 is employed on either a ground or airborne alert it must proceed directly to its target at the outset of war. It does not have the almost unlimited range of ANP and it is difficult and very expensive to harden it so that it could ride out attack by ICBM's. Therefore, whether carrying several small weapons or one big weapon, *it competes with ICBM's for the job of destroying fixed targets.*

And the ICBM can do the same job far cheaper.

However, the B-70 does have a remarkable and critically needed growth potential. Application of ANP to this aircraft would give us the most versatile weapon system this nation ever possessed. The bombing-navigation system (BNS) and the ECM equipment will unquestionably be required in any future nuclear powered plane. Recent reinstatement by the Air Force of the BNS and ECM portion of the B-70 development reflected sound judgment because of the long lead time required of such sophisticated equipment.

**F-108**—The recent cancellation of the F-108 program was a mistake. With ANP and VTOL nearer fruition each year (even at our own "business as usual" pace), we must also build a defense force capable of destroying such weapons. Perhaps the most important part of the F-108 program was its airborne radar detection and fire control system. We must give the Soviets capability credit for "standoff" missiles, such as the cruise-type Hound Dog and the ballistic ALBM. It is imperative that stand-off missile carriers be brought under attack as far from their targets as possible.

The Navy showed excellent judgment in picking up the most valuable and most easily overlooked part of the F-108 program—the electronic gear. It will be an invaluable asset a few years hence. This equipment is essential to any future defense against nuclear powered aircraft.

**Polaris**—The Polaris already possesses mobility, will soon be operational, and can make an important contribution to our strategic offensive force by attacking airfields, fixed air defense sites, submarine pens, nuclear weapon storage sites, etc. *They should not be intended for the suicidal destruction of Russian cities.* But by attacking the enemy's air defense structure, for example, they can aid in degrading the Soviet defenses so that carrier aircraft can penetrate hostile airspace. Since they can only be used against fixed targets, the limitations cited for ICBM's apply to Polaris as well—future war will not be won solely by destruction of fixed targets. The number of fixed targets demanding so expensive a weapon will be limited and the resources which should be devoted to this interim mobile weapon will also be limited.

**Attack Carriers**—Carrier aircraft, provided the carrier can be protected for a reasonable period of time, possess the capability to attack mobile, fleeting targets and targets of unknown or uncertain location. However, one limiting factor must be pointed out here. Because of the rather short range of

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carrier based bombers, the aircraft carrier must be perilously close to enemy shores in order for the bomber mission to be effective. To protect itself from attack even in peace, it must be so far from enemy shores that the bomber mission is at best, far from optimum to deal with mobile, unknown or uncertain targets. Perhaps the most important contribution of carrier aircraft in general war would be armed reconnaissance.

**Post Attack Reconnaissance**—Today our deep post attack reconnaissance capability is limited almost entirely to SAC aircraft. At the start of general war, in the ICBM era, SAC will launch its aircraft and will receive post attack reconnaissance from them for approximately 12 to 18 hours. At the end of this time all intelligence as to what targets have been destroyed and, most important, what targets remain to be destroyed will cease.

It will cease because destruction of SAC airbases will prevent successive missions for the surviving aircraft. It is important to understand that with today's aircraft little effort will have been made to locate and destroy the enemy's mobile forces. The bombers lack range and they must attack fixed targets which have been selected for destruction prior to the start of the war.

Even if the ICBM era were devoid of manned aircraft, post attack reconnaissance would be absolutely essential. One would have to know to what degree he was successful in his attack so that surviving *fixed targets* could be eliminated. Attempting to destroy mobile missiles would be exceedingly difficult *without* post attack reconnaissance—without it the problem appears hopeless.

For several years reconnaissance satellites cannot be expected to produce all the post attack reconnaissance so vital in war. The recent successful TIROS (weather satellite) shot is a marvelous achievement. The geographical features of the Gulf of St. Lawrence, the Mediterranean, and Saudi Arabia were pointed out in several photos. But being able to recognize the Mediterranean is still a long, long way from being able to spot an object on the ground the size of a missile or plane.

In any event, to destroy mobile targets requires that the instrument of perception be capable of almost instantaneous attack, or the mobile target will have changed position. After detection of mobile forces by satellite, their destruction by ICBM's remains all but impossible because of the time of flight of the ICBM to its target.

**Hardened, Fixed ICBM's**—For reasons of economy the military has lo-

cated and plans to continue locating, fixed ICBM sites relatively close to major military installations and population centers. In light of considerations mentioned above, this practice is sheer folly and should be abandoned.

**Satellites**—The DOD is developing military satellites such as Midas, Samos, and the communications satellites. It is also trying to develop an anti-missile missile. But, the military space program, when examined in the light of this series of articles, contains two obvious deficiencies. These are, at the very least, deficiencies in assigning the proper priority to the programs.

When satellites begin to do a military job we must concurrently have the means of neutralizing or destroying them.

**Satellite Detection**—We must have (1) a reliable and effective passive detection system and (2) an anti-satellite missile. The present arrangement wherein Army, Navy and Air Force through ARPA devote such funds as may be available to the development of a detection "fence," together with its sophisticated computers, is inadequate.

The recent experience of our military being unable to positively identify an

(continued on page 50)



**AIR FORCE RECRUITERS PUT CESSNA U-3A SUPPORT PROGRAM TO THE TEST.** Their work at a small midwestern university done, two Air Force recruiters prepare for take-off—only to find that their battery, beset overnight by sub-zero cold, has gone dead. Course of action: Requisition the nearby Cessna distributor (U-3A supplier) for a new U-3A battery, be airborne by noon. A simple thing. Made possible by a nationwide off-the-shelf support program growing out of Cessna's support of the U-3A's commercial counterpart, Model 310, and conceived by Cessna to do for the Air Force what it would find prohibitive to do itself.



For more facts request No. 3 on reply card.



## WESTINGHOUSE INFRARED FOR SPACE

RECONNAISSANCE BY SATELLITE, one of many space jobs—World-wide weather data can be gathered by systems incorporating the Westinghouse Space Thermicon. Cloud cover and other meteorological data "seen" can be obtained at a high rate. Photo mapping is also possible from IR-stabilized vehicles.

**1. SATELLITE STABILIZATION**—Satellites must keep fixed positions in orbit if they are to perform the vital jobs foreseen for them. A key element designed for such systems is the Space Thermicon, an IR development at Westinghouse. This lightweight, static, electronically scanned "heat-seeing" device operates day or night, guiding the satellite by detecting and responding to Earth's infrared radiation.

**2. DETECTING OBJECTS IN SPACE**—Fire control systems in stabilized satellites can be designed around advanced Westinghouse infrared equipment. Here static, electronically scanned sensors with a wide field of view can detect and track objects, providing data at a high rate with high accuracy and top reliability.

**3. IR COMMUNICATIONS**—Westinghouse developments will permit use of active infrared radiations to carry voices or other signals on a narrow microwave beam. Such a system would be almost impossible to detect or jam. It uses low power and requires little weight, and yet is useful for most communication requirements. Its "security" makes it particularly valuable in military applications.

## HERE ARE A FEW OF ITS IMPORTANT APPLICATIONS

**4. AIRBORNE DEFENSE**—Westinghouse-developed infrared devices, techniques, and systems, to detect and track enemy missiles or aircraft, offer vital advantages in both bomber defense and interceptor fire control systems. Such systems operate in daylight as well as darkness. Effective differentiation between targets and background is obtained.

**5. TANK FIRE CONTROL**—Infrared systems developed by Westinghouse offer special advantages such as 24-hour fire control capability. They are rugged, compact and cannot be detected by an enemy. Electronically scanned sensors eliminate problems of complex optical or mechanical linkage.

**6. UNDERSEA DEFENSE**—A broad program incorporating Westinghouse developments in scanning systems, sensors, and special circuitry make possible detection of submarines in a tactical environment.

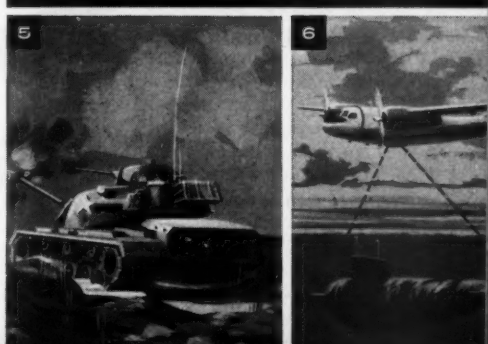
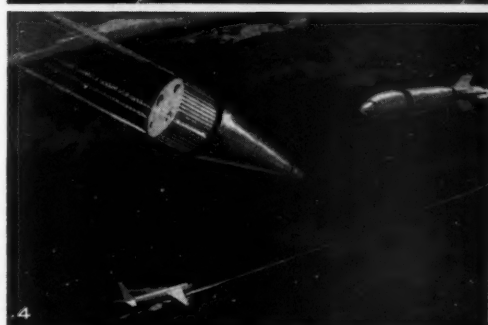
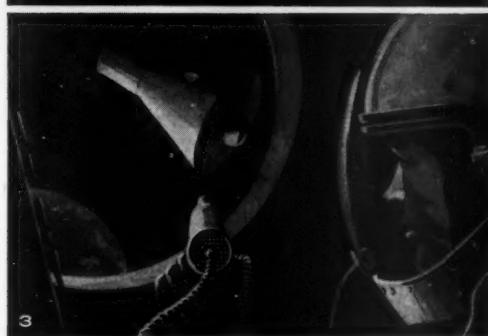
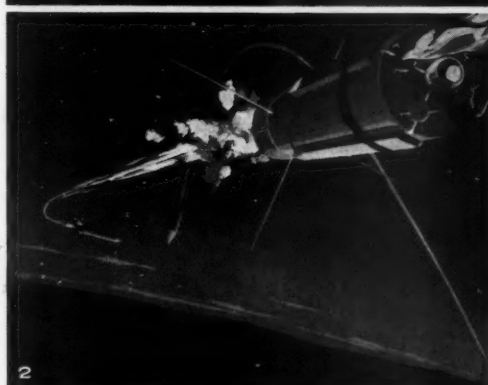
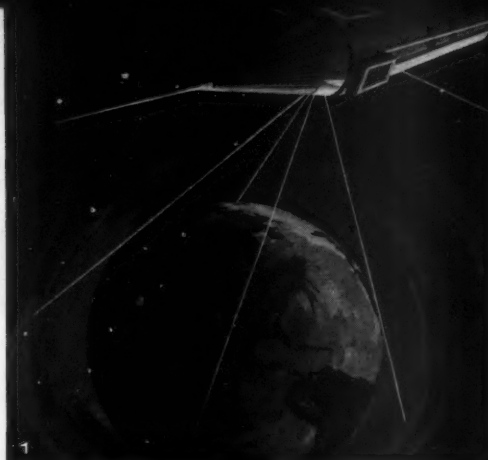
Engineers at the Air Arm Division of Westinghouse Electric Corporation are developing a variety of advanced infrared systems for the Army, Navy and Air Force . . . another demonstration of *Westinghouse Capabilities for Defense*.

## WESTINGHOUSE

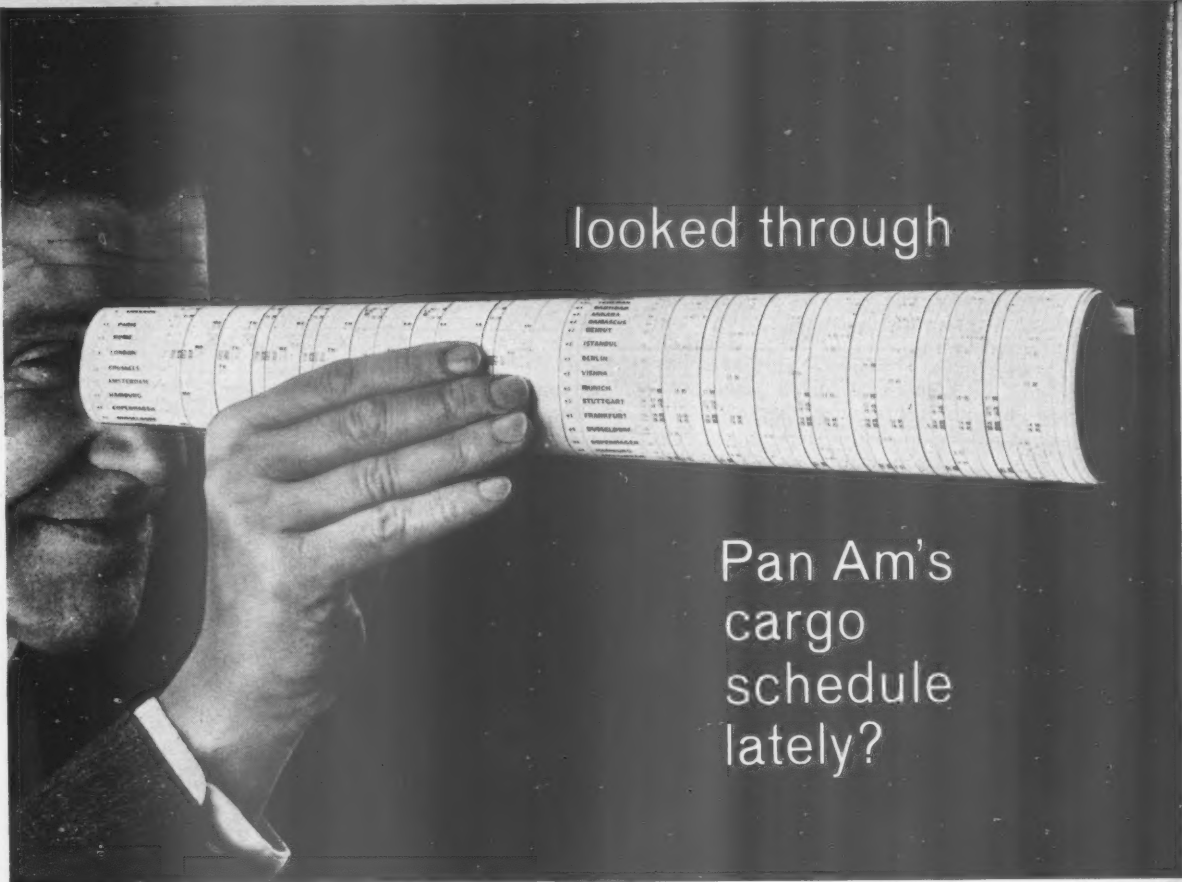
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†Effective June 1, 1960

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### This Month:

## Maj. Gen. Beverly H. Warren

Commander, AMC Aeronautical Systems Center



**"WE DON'T ACTUALLY SPEND** \$6-billion a year at Aeronautical Systems Center. Our new money is only about \$2.5-billion. It's the programs for which we have management responsibility that add up to the larger figure."

Drawing the fine line between the big figures is Major General Beverly Howard Warren, Commander of Air Materiel Command's Aeronautical Systems Center, the Air Force organization responsible for just about every major aeronautical end item—except ballistic missiles—that the Air Force buys, along with much of the supporting equipment that goes into making sure the end product in mind is able to do its job when it has to.

In making sure that the job is done right, top-flight management is an unavoidable must, and because of his full realization of this—coupled with an Air Force career that has dealt more than heavily in the materiel business—General Warren was the logical choice for the Air Force when the top ASC job opened up in September, 1958.

Perhaps the best description of Gen. Warren and the way in which he approaches a job is offered in his decision to take up golf, and the way he followed up that decision. Only a tennis player until about eighteen months ago, Warren decided to go after the game of golf on a full time basis. From there on in, he began playing eighteen holes every Saturday, eighteen on Sundays, with the rest of the weekend spent practicing chipping and putting. Given the effort involved, it is not surprising that Gen. Warren is now shooting an entirely respectable game of golf in the mid-eighties.

Thoroughness, attention to detail and excellent background all are part of what Warren offered to ASC when he took over in 1958. As for the attention to detail, perhaps the best measure is the Legion of Merit he won in 1944 for his part in developing an improved cruise control method for B-29s.

As he describes it himself, "Up until that time, it was normal procedure to think only in terms of engine speed—you picked a set number of rpm's and stuck with them. This of course took no consideration of such things as wing

load, and so as you burned fuel and lightened your load you began flying faster and faster, using much more gas than necessary. By allowing for this sort of thing, we were able to fly B-29s with a full bomb load from Okinawa to Japan and come back with fuel to spare. Previously, we had to cut our bomb loads by some 2000 lbs., and even at that we had planes run out of gas on the way back."

One idea that Gen. Warren feels has a direct application to the work he is doing now is that "The day of the single inventor is almost gone. Today there are so many millions of ideas, and so many of them must rely on other areas of technology before they can really bear fruit. Electronics, materials, environmental factors, all must be considered in most military products, and no one can possibly be an expert in all of these areas. It's the same way in medicine. There are very few doctors today who will give you an unqualified diagnosis on any kind of symptoms you may have."

A man whose feet have a tendency to end up on his desk, Warren is easy-going only so far as his job allows him to be—when it comes down to dollars and cents, he would be a nice ally at the conference table, and a formidable negotiator if you were trying to cut corners. His comments on what he feels about the people Air Force must do business with are typical.

"The last thing we want to see is all of our business centralized in a few hands. But neither do we want to spread it around just for the sake of keeping people in business. Our outlook on this is to avoid the regimentation that results from having too much centralization. With this in mind, we try to spread our dollars as much as we can. It's tremendously important to have as many people looking down different avenues as we possibly can, and it's equally important that the people that do business with us offer a good, aggressive management outlook."

In the foregoing lies the germ of what is probably the most dominant characteristic of the entire Aeronautical Systems Center—that of change. Says Warren, "I would like to do nothing better than sit here at my desk with

a total Air Force program that had in it nothing in the way of change. But if we have even one project around here that stays that static, it is extremely rare."

For the future, says General Warren, "We will probably have fewer programs, but all of them will probably have as many changes inherent in them as the ones we have now. I cannot, for instance, visualize a continuing B-58 program without some sort of changes in it. By changes, I mean such things as improved navigation, power plants and so on. Each day we find ourselves with a new problem, and the patterns never stay the same."

This is compounded by the rather obvious trend to fewer and fewer buys of each new system that enters the Air Force inventory. "Where we used to deal in thousands, it has become hundreds, and today, with such items as Samos or Midas, our work may involve a matter of only four or five complete systems."

General Warren also cites the problems which are "inherent in spending public money rather than our own. In many ways we are probably more restrictive in our outlook than most private businesses."

Since 1940, Maj. Gen. Warren has stayed about as close to the business of buying weapons as was possible, with interspersed flying time. Beginning as a Plant Representative for the Army Air Corps, he progressed to technical advisor to Midwestern Procurement District.

In 1946, Warren worked at AMC as Plant Representative to Convair-Fort Worth, where he worked closely with the then-new B-36 program. In 1951, he was named Chief of the Production Division at AMC Headquarters, and was later named Deputy Director of the Procurement and Production Directorate. He then went to Oklahoma City Air Materiel Area as Deputy Commander, followed by a tour as Deputy for Materiel for the Far East Air Forces, where he received his first star.

Returning to Wright-Patterson AFB and the Directorate of Procurement and Production in July 1957, it was just over a year later that he became Commander of the Aeronautical Systems Center.

What this experience adds up to is a man who probably knows the Procurement and Production business at least as well and probably better than any other single individual in the Air Force. There is no better measure of this experience than its result for ASC—a top-flight business executive who is able to head up a fast moving, dynamic organization in the face of "a different problem every day."

## Airlift in Action:



## Airlift speed begins with loading



## The C-130 Hercules is the fast-loading champ

Lockheed's prop-jet C-130 HERCULES was designed to be as fast on the ground as it is in the air. It is ideally configured for any type of loading—from docks, truck beds, or with mechanical loading systems. Its huge aft doors open to provide a 9 x 10-foot cargo opening—the lower half of the door serving as a fully adjustable ramp up which tanks, trucks, bulldozers can be quickly driven. And 92 battle-ready troops or 64 paratroopers can board the big C-130 "on-the-double."

Hours saved by the C-130's quick loading cuts turn-around time to a fraction of that customarily required. Airborne, the C-130 climbs over the weather to cruise at 315 knots (360 mph). And it has intercontinental range.

Famous for its headline-making "Feats of Hercules"—from Pole to Pole, and around the world—the Lockheed prop-jet HERCULES provides more Jet Age airlift per dollar than any plane flying, now being produced, now scheduled for production.

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MUCH has been said about the new art or profession of value engineering, but as I see it, there is very little new in this method of analyzing a problem. This is the analytical approach to design work that every decent engineer should use seven days a week.

Most value engineers believe their department should be directly under the Executive Vice-President and that they should be able to move through the organization looking over everyone's shoulders and generally disrupting organization channels.

All examples of savings and improvements used in literature on this subject indicate that the value engineers studied the finished product and then made improvements on this end product.

Is it not much more logical that these people be placed in the established engineering department where they could either review initial design or use their talents to design or eliminate items prior to original purchase?

This would mean that the first million items would not be built with an expensive component and there would not be a full series of expensive spares in the spare parts system to support a component that should have been eliminated in the first place.

Rather than use value engineers as an overhead group with all the bad feelings generated by pushing ideas down through the organization as criticism of design, it appears much better that this organization operate as follows: These people who have special know-how in plastics, mechanical engineering or gadgeteering could be assembled as a part of the engineering department for design review. After a prototype has been made, this group reviews the prototype in detail, looking at each part for necessity, functionality, and the material out of which it is constructed. Then the group makes its recommendations to the people who normally would do final drawings or the final model of the particular item.

The item then goes to the drafting room where it is drawn up for final purchase and specifications and becomes established. After this model has been made, and the first group of items procured by an outside contractor, all ideas of the contractor or manufacturing group should be collected and assembled by the same study group. Changes are recorded on the drawings so they will be ready for the next order. In this way, any new ideas are collected and made available for immediate use. This puts the whole organization on the value analysis team and doesn't single out a bunch of smart boys.

# Payroll Engineering Versus Value Analysis

by Louis E. Garono

Chief Engineer  
U.S. Army Chemical Corps Engineering  
Command

Now this kind of operation is not going to show the enormous savings normally credited to value engineering, and no particular person or group is going to get credit for saving hundreds of thousands of dollars by simple mechanical changes. But this method does make for a smoother organization and will pick up *many more savings* than a flashy high level value analysis organization.

It may seem odd that enormous amounts of money can be saved as indicated in the recent article "Who Needs Value Engineering?" by RAdm Richard Mandelkorn, telling how \$18 million was saved in shipbuilding in the first year.

This means only one thing: That the Navy's attitude has changed abruptly—that the Navy is taking a closer look at their need for brass valves, port-holes, and many nice but not necessary items for equipping ships.

It means that in the past Navy was building ships for a life expectancy of 20 to 30 years, and that they have all of a sudden realized that ships are no longer good for that time.

Value engineering might be a useful gimmick to shock the engineers at the various shipyards into changing to a modern concept of using materials and design for normal life of the product. While the idea may be new to some industries, it certainly is not new to the chemical or appliance business, where items are normally engineered for a life of about five years. Corrosion data indicates how long heat exchangers will last, whether it is economical to use monel steel, and what it will cost the plant to shut down if a heat exchanger is lost or how much damage it will do if a shutdown occurs.

To get down to the facts, value en-

gineering to date seems to be almost entirely in mechanical engineering. Also, in developing any item, there is never a perfect end item. Almost all appliances, automobiles and even houses know an evolution with new techniques, new materials and new methods of assembly that never stops.

This again is the economic problem of how perfect you want the item and how soon you need to put it on the market. This, as I understand it, is product engineering.

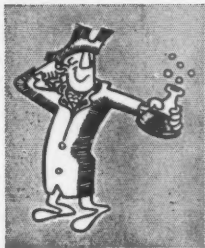
A good example of this is the typewriter—originally a mechanical monstrosity. As we look back on it, the original model was hard to operate, inaccurate, would not make a presentable letter and certainly was not streamlined. As engineering talent and dollars were invested, the typewriter became more presentable, a motor was added to make it easier to operate, adjustments allowed for more or less copies, special carbon paper let it operate more effectively.

Some people believe we have a satisfactory piece of equipment. But the real product engineers don't see it this way. They see the typewriter as a piece of equipment that will take dictation and give you a perfect letter, no misspelled words, punctuation in the right places, grammar unscrambled so that poor dictation will come out in perfect English, and ideas clearly defined to eliminate misunderstanding between dictator and reader. It will take a long time for this to happen, and there will be more product engineering and more dollars spent in the meantime. It may prove, as the value engineers say, that the typewriter as we know it is outmoded, and a new piece of equipment may take its place. This is still product engineering; but I believe value engineering will gain all the credit for eliminating the typewriter and dollars saved with perfect letters.

In conclusion, I believe value engineering is nothing but another name for effective product engineering. I believe it can be done more effectively at a lower level than that proposed by value engineers. I mean to say that the high grade talents of these value engineers should be assigned to equally important work as product engineers, to make the savings without all the ballyhoo.

The only place I can see engineering being applied to this new art of value engineering is in what is commonly known as payroll engineering: Have a new job set up, make it glamorous, indicate enormous savings, get a high rating from the personnel analyst, set up a new department. If this is the kind of engineering the value people are talking about, they have accomplished their purpose admirably.





## Research Rundown

### **BITTERLY CRITICIZED FOR "LACK OF INTELLIGENT PLANNING"**

when Sputnik I went up. Defense contentions about how to run the military-space race appear now to be returning less spectacular but more rewarding value. Launching last month of Tiros I and the space navigation satellites, coupled with some of the techniques used to do the jobs, are understandable proof to an apprehensive public that U.S. missile-space efforts are moving far faster, on a much broader base, than most people realize. Successes have stilled, temporarily at least, that new crop of experts: the born-overnight space philosophers.

### **PROJECT TYPHON, GIVING NAVY TWIN-MISSILE CAPABILITIES**

for its surface ships will use existing missiles (Tartar, Talos) and a new control system to provide surface-to-surface and surface-to-air bombardment. Advanced radar by Johns Hopkins will guide the missiles, to be used as a surface backup for Polaris.

**ARMY ENGINEERS HAVE FORMALLY ANNOUNCED PLANS** for an atomic reactor to aid research work on the Greenland ice cap. The reactor will be a pre-fab unit flown in a piece at a time. Project has been in the mill for over a year waiting for final clearance (see p. 40, April 1959 AFM).

**MONEY SAVING IDEA NOW KICKING AROUND THE ARMY** would combine two missiles into one—the easy way to standardize. Missile A, a direct battle support missile, and Missile B, an indirect support weapon would be the two involved. Both are in early stages of development.

**NOT TOO MANY HARDENED MINUTEMAN LAUNCH SITES ARE LIKELY**, judging from the trend of recent pronouncements. The reasoning: AF Chief of Staff Gen. Thomas White has said the mobile missile occupies top priority with the Air Force, although the technical problems are greater. Even so, time split on operational dates for the two versions should only be about six months. Outside chance: that hardened Minuteman will be by-passed in favor of its mobile cousin.

**MORE NEWS ON MINUTEMAN HAS TO DO WITH SIZE** of the small, solid propelled missile. Reports are that the bird will be under 60 ft. tall, with diameter of largest stage only six feet. Total weight: between 60,000 and 70,000 lbs. Summing up: in both size and weight, smaller than Thor IRBM; weight, about one-fourth that of Titan or Atlas.

**FURTHER PROGRESS ON IMPROVING SHORT-TAKE-OFF-AND-LANDING** characteristics of the Lockheed C-130 Hercules has landing roll down to 500 ft. Using boundary layer control techniques, the plane was run through stall-approach tests at 13,000 ft., with actual landing and take off work still to come.

**SUCCESSFUL TESTS TOO LITTLE AND TOO LATE** are the lot of controversial Bomarc B. In a test to cover about half of its full range, the missile was "completely successful." But test came a day late and a dollar short: some \$300-million of Bomarc funds have been transferred by Air Force to Minuteman, Midas, Atlas and other programs.

**ONE HELICOPTER TO REPLACE THREE CURRENT AIRCRAFT** is one goal for Army's long range aviation planning. To be turbine powered, the helicopter would tentatively come up for first test in 1963. To be replaced: Cessna's L-19, Bell's H-13 and Hiller's H-23. New copter would be used primarily in reconnaissance/observation work.

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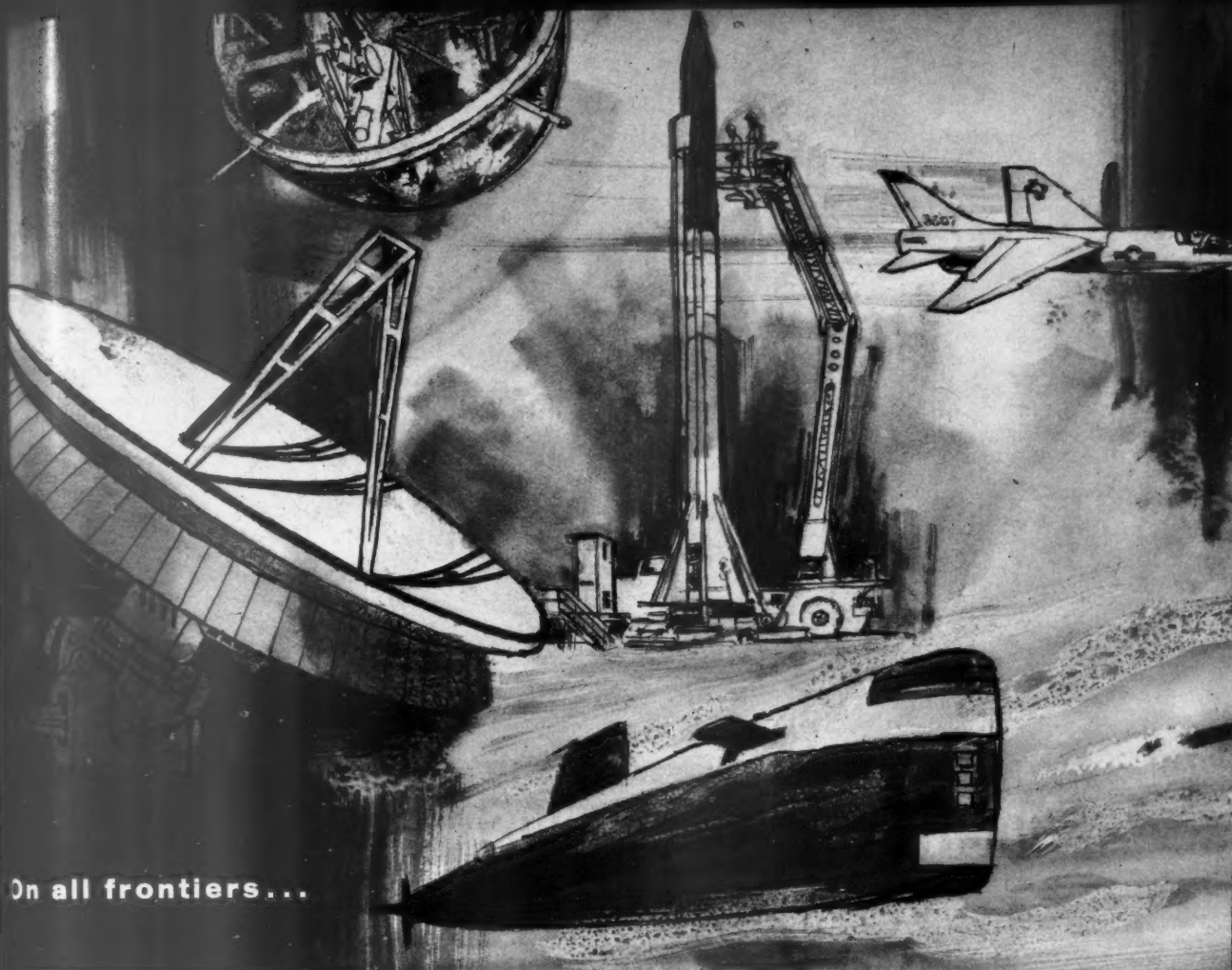
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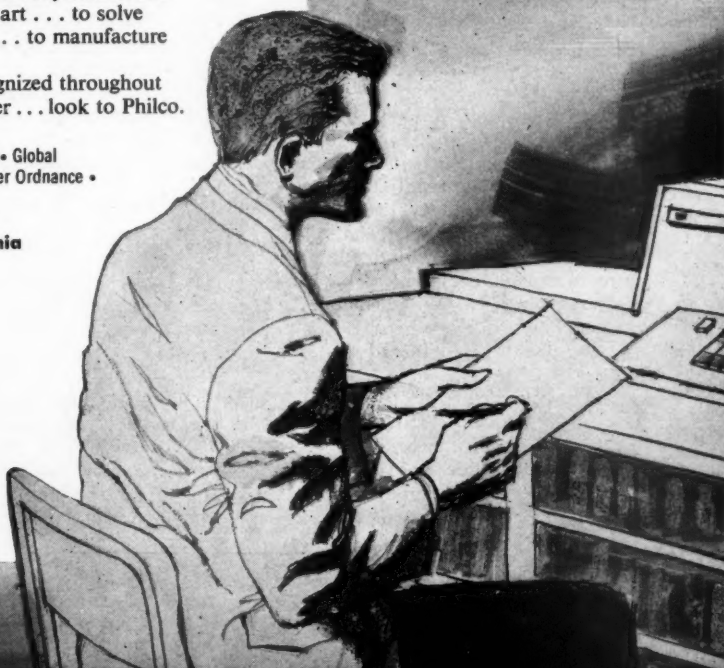
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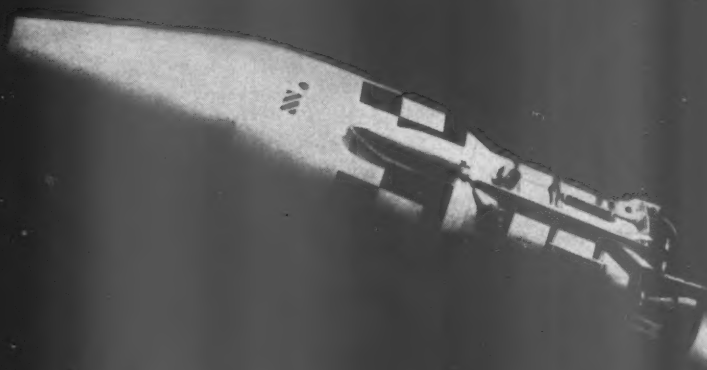
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## Research Rundown

### ARDC Command Division Nears Final Organization

Exact organization structure of the Air Force Command and Control Development Division, under ARDC, will be determined within the next six weeks.

Under Maj. Gen. Kenneth P. Bergquist, initial establishment of the division was announced last month. CCDD will be responsible for Air Force Command and Control systems which will insure timely control of aerospace weapons, and provide adequate warning, communications and intelligence.

To employ about 100 people, CCDD will consolidate the Electronic Supporting Systems Project Offices now located at Wright-Patterson AFB, Ohio and in New York City.

The new organization will work with AMC's Electronics System Center and elements of the Air Defense Command.

CCDD will broaden operations at Hanscom Field to include overall sys-

tems management during development phase on major communications and electronic systems needed by Air Force.

Using commands will participate with CCDD in all phases of development to provide early input into new programs and to insure proper balance between technical and operational aspects.

Formation of CCDD is part of the Air Research and Development Command reorganization program that began October 6, 1959, and will be completed with assignment of various ARDC centers to the four Divisions established in reorganization.

### Navy Nears Wrap-Up On Project Artemis

Navy has disclosed that work is nearly complete on Project Artemis, an anti-submarine warfare surveillance project.

Navy told Senate Appropriations Subcommittee that fiscal 1960 funds would serve to complete most of the project. Navy also revealed that Artemis is a study on the feasibility of ocean area surveillance.

About \$5.4-million in the fiscal 1961 research, development, test and evalua-

tion budget will represent an increase in the aircraft account, caused by intensified R&D for the Missileer program. Also accounting for a portion of the increased aircraft R&D funds is a VTOL assault transport program for the Marines, and studies for aircraft active and passive countermeasures.

Navy said developments are underway in guided missile and related equipment to provide missiles with "multiple target capabilities," at present the only major technical defense for continuing emphasis on manned aircraft.

Navy wants \$658.2-million for its missile and related equipment program, \$36.3-million less than last year. Reductions, Navy said, are due to less RDT&E requirements for Polaris, the Pacific Missile Range, and other regular missile programs.

### ARDC Publishes Research Abstracts

Air Research Development Command describes 1400 scientific projects underwritten by Air Force in "Basic Research Resumés," a 334-page book now available.

Projects are handled by universities,

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industrial laboratories in the U.S. and throughout the Free World. ARDC's own military and civilian scientists perform about 14% of the research listed, universities 62% and industrial laboratories 13%.

About 20% is conducted outside the U.S.—Canada, South America, Europe and the Near East.

"Basic Research Resumés" is available from Office of Technical Services, U.S. Department of Commerce, Washington 25, D.C. Qualified military agencies and contractors can get the volume from Armed Services Technical Agency, Arlington Hall Station, Arlington 12, Va.

### Electronic Surveyor Tested by Army

Lorac—an electronic surveying system for measuring distances and establishing positions—is being tested by topographic engineers at Army's Engineer Research and Development Laboratories.

Working with continuous-wave unmodulated radio transmission sent from each end of the line to be measured, Lorac can be used to measure inter-island and other geodetic ties where line-of-sight conditions do not exist,

and for setting positions of boats, aircraft and land vehicles.

Accuracies of 1:10,000 over 100 miles in mountainous areas can be measured. Over salt water, the range is increased to 200 miles and minimum accuracy is 1:45,000. Lorac was designed and developed by Lorac Service Corp., Tulsa, Oklahoma.

### Mauler Contract Announced by Army

A contract for \$5.5-million has been awarded to Convair Division of General Dynamics Corp. for development of new mobile battlefield air defense missile called Mauler.

Mauler will have both anti-aircraft and anti-missile capabilities. A compact, highly-mobile weapon using solid-fuel radar-guided missiles, each smaller unit will be contained entirely in a single tracked vehicle of standard design. It will be fully mobile, and can deliver accurate fire even while moving.

Mauler units will be air-transportable, and each unit will have its own power supply, target detection and electronic computer fire control equipment, as well as missiles.

To be pre-packed in light weight cases to serve both as shipping containers and launching tubes, Mauler will be operable by one man, although each unit will carry a crew of two or three men.

### Air Cushion Vehicle Being Tested By Army

A new model air cushion vehicle has been delivered to Fort Eustis, Va., for experimentation, Army has announced.

Besides tests over land and water, the air car will be tested this summer over snow and ice in the Arctic. The air cars are expected to carry about 1000 lbs. of cargo or four passengers up to 35 mph over any unobstructed terrain.

The cars, resembling conventional automobiles without wheels, are about 21 feet long, eight feet wide and five feet high. Power is supplied by two 180 hp aircraft engines, and the driver has a conventional steering wheel and throttle.

The air car now under test is one of two bought by Army from Curtiss-Wright Corp., Wood-Ridge, N.J. The second was delivered in mid-April.

## re being built at Satellite Center, U.S.A.



Satellite Center, U. S. A., is located in the San Francisco Bay area at Sunnyvale, California.

From Lockheed's vast new Satellite Systems Building come the Agena satellite of the Air Force Discoverer program; the Agena B planned for lunar and deep-space probes; and the satellites for the Air Force's Midas (missile defense alarm system) and Samos (strategic surveillance system).

**LOCKHEED**

MISSILES & SPACE DIVISION  
SUNNYVALE, CALIFORNIA



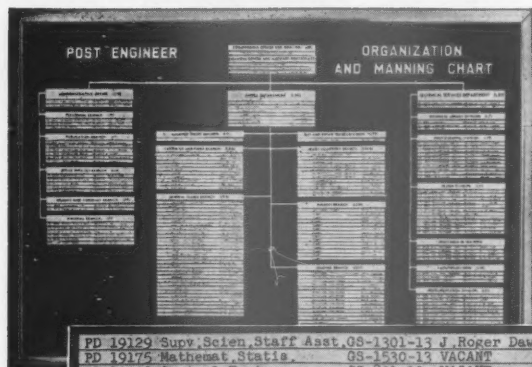
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## Industry Developments

### Procurement Regulations Scored by Industrialist

Many responsible small businessmen say it is "folly" to enter defense work because the government "imposes conditions both confiscatory and destructive to small business," according to Denham Scott, Assistant to the President of the Garrett Corp.

Testifying recently before the House Small Business Subcommittee, Scott said existing rules and specifications governing defense procurement policy deprives small business of proprietary rights. Scott said that it is a popular misconception that the government pays for all development of weapon systems and other defense programs.

He said the small businessman working on defense contracts "must inescapably become contractually obligated to conform to a bewildering maze of regulations, specifications, contractual clauses . . . and 'what nots' . . . all of which stem from the government with whom he has neither a contract nor a contact."

Scott charged that the small businessman must give up drawings of his products and that these drawings are eventually used by the government "to shop around among competitors."

### Ryan V/STOL Aircraft Completes Army Tests

The VZ-3RY vertical and short take-off and landing research plane, designed by Ryan Aeronautical Company, had completed a highly successful flight test program for the Army prior to its delivery to the National Aeronautics and Space Administration when it crashed in a NASA flight.

Among the tests were hovering flight at zero air speed, near-vertical take-offs after ground roll of only 30 feet and conversions from hovering to forward flight. Tests covered a six weeks program at Moffett Naval Air Station, Calif.

Navy has also begun a VTOL transport development program for the Marine Corps. The VZ-3RY is a conventional aircraft using large flaps to deflect slip-stream. It can take off at only 22 knots and land at 17 knots. In one flight, the Army craft operated 17 minutes at less than 20 knots under 100 feet.

The plane is powered by a gas turbine engine driving two large propellers. The deflected slipstream gives the plane its vertical rising ability while in a horizontal attitude.

ARMED FORCES MANAGEMENT



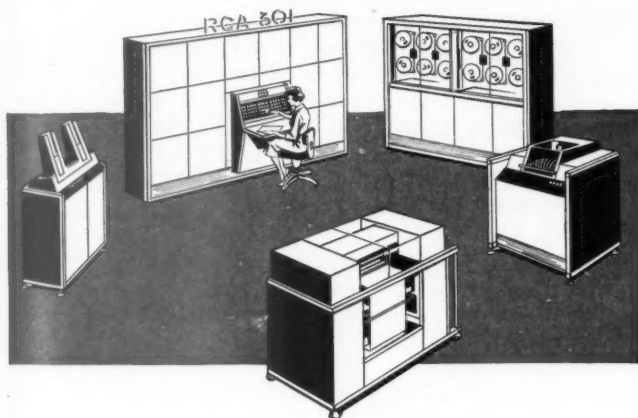
# BIG NEWS

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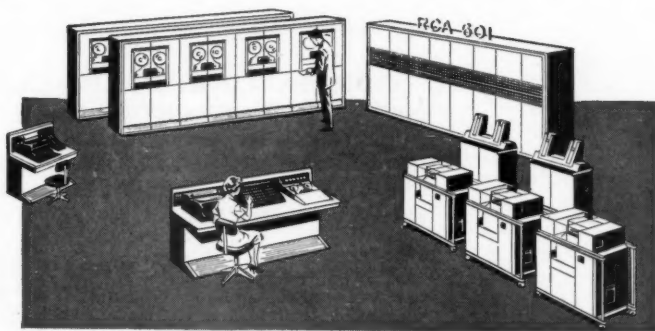


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- **PARALLEL PROCESSING** permits handling a multiplicity of independent programs with changeable priority
- **UNPRECEDENTED COMPATIBILITY**—with RCA data processing and communications equipment and other processors
- **OMNI-CHANNEL INPUT/OUTPUT** permits transfer of information to and from as many as 64 sources, with concurrent computing

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## Procurement Trends

**LATEST WORD ON SINGLE-MANAGEMENT-FOR-COMMUNICATIONS** is that decisions on what to do about the proposal will come "soon." Delay, some of it, so far, has been due to difficulty of getting men with the authority together long enough to come up with an answer. Many, including Defense Secretary Gates, have been on a rash of field trips in the last six weeks—to Europe, et al.

**GOOD RECORD ON COMPETITIVE BIDDING** has been racked up by Army for the last year, according to recent Congressional testimony. Lt. Gen. R. W. Colglazier told the House Appropriations Committee that 25.9% of Army's 1959 spending was under competitive, the rest under negotiated or other means. For pure competitive bidding, the service average runs "about 15%."

**RAPID TECHNICAL PROGRESS AND A LONG PREDICTED LIFE TIME** are latest points of interest on the Polaris program. VAdm. J. T. Hayward, Navy's DCNO/Development told Congress that the mobile, underwater missile should have a spot in Navy's inventory for nearly 20 years—something of a bright spot in these days of short production runs and rapid obsolescence.

**AS IF IN PREPARATION FOR THE LONG LIFE OF THE MISSILE**, a Naval Weapons Annex to handle the Polaris has been opened in South Carolina, will service subs carrying the missile in the Atlantic. Annex has test facilities built in, will serve as an assembly point for missile components.

**BALLISTIC MISSILE EARLY WARNING SYSTEM** is due for increased emphasis in the very near future—even sooner than has previously been reported. First reports set a date of about four months, more accurate estimates set the acceleration date only about three months away.

**BULLPUP TRAINING COSTS ARE BEING CUT BY AIR FORCE**, with a likelihood that Navy will follow suit shortly. How it's done: Martin Co. has designed a trainer rocket using surplus HVAR World War II motors, a slightly smaller airframe than the Bullpup itself, weighing only about one-fifth as much.

**AIR FORCE WANTS BETTER COMMUNICATIONS FOR SAC**, has asked Congress to approve the first part of a \$300-million system which will rely on electronic data processing to provide speed and accuracy. Development work on the system was begun last year, with an eye to "accelerate the flow and analysis of essential command information. . ." (See June, 1959 AFM, p. 16).

**INDUSTRY COMPUTER HOOKUP NOW IN OPERATION** may have worthwhile applications for the military. Microwave data relay system between North American Aviation's Rocketdyne and Los Angeles divisions. Handling up to 85 reels of tape a day, the system transmits information, can switch overload work from one IBM installation to another to keep things running a full pitch at both ends.

**MARINE PERSONNEL WORK WILL BE SPEEDED AND EASED** through use of recently opened National Cash Register computer system. In less than 24 hours, the system can come up with a nationwide picture of the Marine's personnel, stands to save the Marines some hundreds of thousands of dollars annually.

**COST-BASED BUDGETING STANDS READY FOR EXPANSION**, with Defense Department waiting for proof from Operations and Maintenance which has started doing business this way. Proof time: about two years. The next steps: Personnel, Procurement and RDT&E, in that order.

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## New System Speeds Item Identification

Air Materiel Command has launched a new system to ease the laborious task of digging out item identification numbers, called Automated Identification Data System (AIDS). The new system will be built around an IBM 705, with its capacity for sorting and processing large quantities of cataloging data in short time periods.

Air Force hopes the new system will: (1) Eliminate discrepancies in stock numbers that formerly caused Air Force difficulty, time and expense when later revealed. (2) Eliminate purchase of items already existing in AF inventory. And, (3) drastically reduce the 125-day cycle needed for furnishing stock numbers on new items.

Further, the system allows Air Force to verify numbers furnished by contractors at much less cost. When contractors give Air Force part numbers without stock numbers, it is now possible for the contractor to get the correct stock number.

AMC currently processes about 10,000 items in this category each day. In the future, Air Force says the figure will grow.

Through the new system, files for processing will be reduced, manual screening will largely be eliminated, statistical and management data will be more timely and accurate, and more up to date information will be included in cross-reference indexes of part numbers and stock numbers.

## Army Airlift Needs Outlined by Lemnitzer

Army Chief of Staff Gen. Lyman Lemnitzer has outlined Army's needs for tactical and strategic type aircraft for the House Defense Appropriations Subcommittee.

In the tactical area, Army wants a medium assault transport that can carry a 10-ton payload with an operating radius of 1000 nautical miles. The plane would take off and land with no more than 500 feet ground roll on level unprepared ground under standard conditions.

The tactical assault aircraft would be able to handle night and instrument operations, and would be able to drop troops, supplies, and equipment by parachute. To be used for intra-theater assault and logistical

operations, the plane would ideally have aero-medical evacuation facilities built in.

For strategic aircraft Army wants an aircraft that can carry 30 tons in an operating radius of 1500 nautical miles or over a critical leg of 3,500 nautical miles. The big plane would takeoff and land with about 1000 feet of ground roll, and would be capable of night and instrument operations.

Also, the strategic airplane would be able to carry 225 combat-equipped troops, and be capable of fore and aft loading.

In other questioning before the committee Lemnitzer said "Army is not completely satisfied with the present plan to furnish to airlift from CRAF."

Specifically, Lemnitzer has said that although Army has been told CRAF will be available within two days of the time an emergency is declared, total availability of the planes "in less than a month is questionable." Lemnitzer also expressed doubt on the ability of CRAF planes to lift certain Army items of equipment. "This deficiency," he said "stems from the fact that all CRAF planes were originally designed as passenger aircraft."

## Spares Competition Proposed by AMC

New steps to break out replenishment spare parts for competitive bidding will result from recent service tests at Air Materiel Command.

Maj. Gen. W. A. Davis, AMC's director of procurement and production has told the Senate Small Business Procurement Subcommittee that a recent AMC directive (AMC Regulation 57-6) outlines procedures to progressively increase those items which may be procured competitively from commodity industries that normally produce them. Service tests showed "substantial savings" possible.

All drawings and data for listed parts will be reviewed by maintenance engineers to determine suitability for competition. They will be released for competitive bid when they: (1) are non-critical from safety and performance standpoints; (2) do not need special tooling; (3) conform with standardization and intra-changability needs for spares; and (4) are determined by qualified technicians to be otherwise suitable.

Data available at time of determination must satisfy all needs for the procurement action planned before it

is listed as a competitive item, the directive states. Also, if data is deficient, "no action will be taken to acquire or formulate additional procurement data."

## Polaris Audit Set, According to GAO

General Accounting Office will expand its auditing investigation to the Polaris missile program, that agency has announced.

GAO's statement was made to Congress as part of a list of planned investigations. Among other programs to be reviewed are: B-58 Hustler; KC-135 jet tanker; B-52 bomber; and, Bomarc aid-defense missile; Redstone and Jupiter missiles; Polaris; and Navy F-3H Demon fighter.

Testifying before the House Independent Offices Appropriations Subcommittee, GAO said "we intend to concentrate our efforts on selected procurement programs in order to insure coverage of major procurement activities of each of the military services."

"Audit work of the various regional offices will be directed to selected procurement programs through scheduling of coordinated reviews of specific contractors and subcontractors."

The Polaris program, which GAO intends to audit, is one which has had a remarkable history of success. To date, all technical objectives on the program have been met far ahead of schedule, and the missile is set to become operational this fall, nearly four years ahead of original date planned.

## Weapons Command Installs RCA 501 System

A fully transistorized high speed RCA 501 Electronic Data Processing System has been installed at Army's Ordnance Weapons Command.

Consisting of a number of individual units which can be operated separately or together, the system will greatly speed data processing at the Army installation. Army expects shorter lead time, great savings, and better and more accurate management information.

Also, records which now occupy thousands of feet of files will be reduced to magnetic tapes, using only part of the former space.

The equipment will process all information needed to manage receipt, storage and issue of some 80,000



## NEW REACTOR DEVELOPED

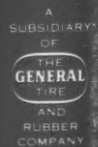
by AEROJET



Attainment of criticality by the Gas-Cooled Reactor Experiment in Idaho is a step forward towards compact, transportable nuclear power plants. This facility to test advanced concepts for mobile power reactors was designed and developed by Aerojet-General Nucleonics, San Ramon, California, and the Aetron Division of Aerojet-General Corporation, for the U. S. Atomic Energy Commission. As systems contractor for the Army Gas-Cooled Reactor Systems Program, Aerojet is designing the world's first mobile power plant.

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supply items in support of Army weapons. When fully operative, the system will be able to handle about 265,000 items of Army-owned production equipment.

## Pipeline Priorities Set Up by Navy

New material priorities, considering both over-all importance of a naval unit's mission and the military essentiality of material needed, have been set up by Navy.

The new priority designations clearly define mission categories of units and "end use" needs, and Navy can now ship material in strict accord with its contribution to over-all Navy missions.

Besides being used in determining material shipment priorities, the system may also allocate communication channels for logistic traffic, allocate critical production materials in short supply, and be used in short supply situations requiring rationing.

The new system went into effect on January 1, and resulted from a two-year study by Office of the Chief of Naval Operations, Bureau of Supplies and Accounts and the Commanders of the Atlantic and Pacific Fleets.

## More Caribous Desired by Army

Army wants 22 more Caribou tactical transport aircraft, according to Maj. Gen. Robert J. Wood, deputy chief for R&D before the Senate Defense Appropriations Subcommittee. Army wants \$1.041-billion in new R&D funds for fiscal 1961.

Wood also said Army will initiate design competition for a new light observation helicopter this year. Such a helicopter would replace "obsolescent" H-13 and H-23 helicopters and the L-17 fixed-wing aircraft.

Also in the Army program for fiscal '61 will be continued work on the Iroquois helicopter, component development and flight test on the Chinook, a new multi-turbine transport helicopter, and further research on the Mohawk. The Chinook is set to go operational in fiscal 1963.

Army also requested \$1.8-million to wrap up Little John rocket development work and \$24.8-million for the Mauler mobile guided field missile.

Guided missile research funds stand at \$494-million under Army's request. Of this, \$396-million would be spent on two missiles: \$287-million for Nike-Zeus and \$109-million for Pershing. These two programs represent 80% of Army missile funds.

## GAO Would Broaden Anti-Kickback Law

General Accounting Office has asked Congress to broaden the so-called anti-kickback law to cover all negotiated procurement contracts.

The current law is limited to contracts based on cost-plus-fixed-fee or other cost-reimbursable negotiations.

Aim would be to cover "new types of negotiated contracts" which have been developed since passage of the law. GAO noted a speed up in use of other types of contracts, and specif-

ically cited the price redeterminable contract, which would not be covered under the present law.

GAO said contracting where there is generally "no opportunity to compare going prices with the prices negotiated . . . makes this sort of contract more susceptible to kickbacks."

GAO said it is concerned that the bulk of military buying is under circumstances which do not always afford government full assurance of a fair and reasonable pricing which would result from full and free competition.



Emergency spare parts in hand, Air Force pilot leaves Cessna U-3A supplier, one of many designated to serve USAF across America.

## LOGISTICS PROBLEM—SOLVED BY CESSNA

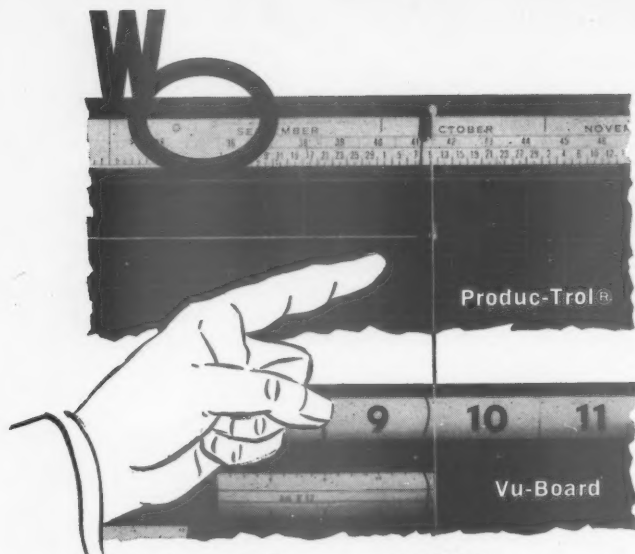
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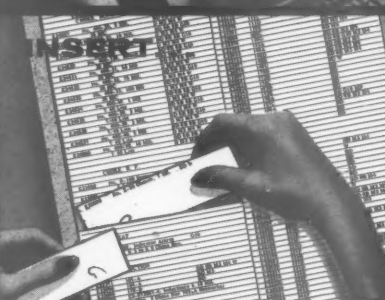
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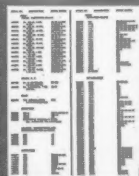
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## Air Force MAP Pricing Questioned by GAO

General Accounting Office is pressing Air Force to return funds—or get specific Congressional permission not to—for aircraft, parts and related material transfers to the Military Assistance Program.

The GAO report submitted to Congress indicated that excess amounts paid, not authorized under law, could run into hundreds of millions. Air Force said anticipated reimbursements from MAP are considered when Air Force draws up its budget, and later reductions would result in Air Force programs being under-financed.

"We recognize that transfers by the Air Force at lower prices than those contemplated in developing its budget may result in under-financing Air Force programs. However, this does not justify charging prices to MAP in excess of those authorized by law," GAO said.

Further, GAO criticized Air Force for charging standard prices for spares, regardless of whether they were excess. "Except for aircraft," the report said, "Air Force has not adjusted prices for equipment delivered to MAP."

## Armor Test Range Built by Kaiser

A firing range for ballistic tests of aluminum armor plate has been established by Kaiser Aluminum & Chemical Corp., cooperating with Army's San Francisco Ordnance District.

The first of its kind in the aluminum industry, the range will be used to test the aluminum armor plate that Kaiser supplies to ordnance vehicle manufacturers.

The range is equipped with instrumentation for velocity measurements and special safety and security devices.

In further work with aluminum, Kaiser track shoes for military tanks have been tested and run through field trials at Army's Aberdeen Proving Grounds. Kaiser reports the shoes survived the worst conditions the course had to offer. Aluminum track shoes would save about 1000 pounds on a medium tank.

## New Missile Test Gear Demonstrated By RCA

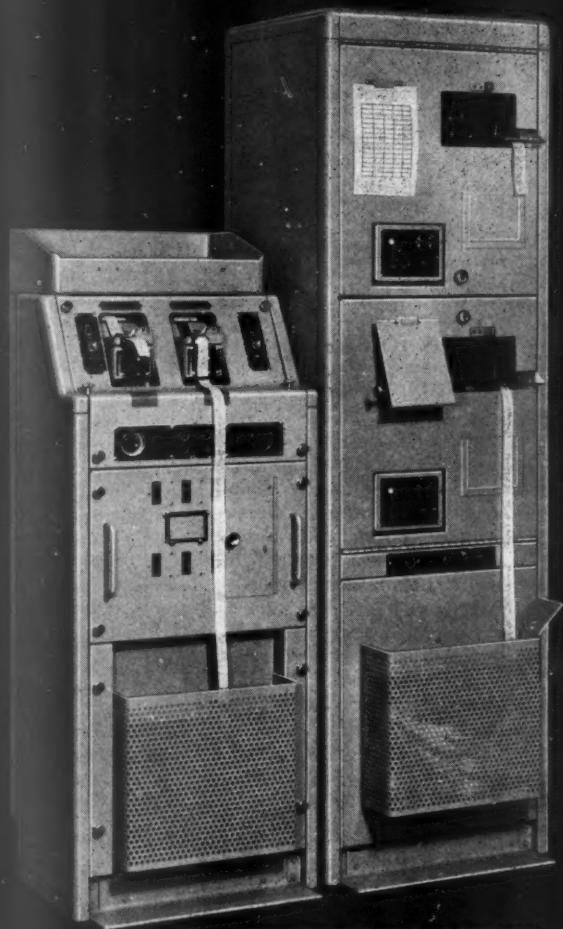
A new missile check out system that will drastically reduce time needed for this operation has been demonstrated by Radio Corp. of America.

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automatic test equipment cuts manual check out time on one system in the Hawk missile from 240 minutes to 5 minutes, according to RCA.

Demonstrator equipment checked out a "black box" subsystem of the Hawk containing 115 components and 17 electron tubes. When a fault was introduced into the system, the equipment isolated the faulty component in only two and one-half minutes.

The checking system can also be used with Lacrosse, Corporal, Nike Ajax and Nike Hercules.

According to a company spokesman, "We estimate 80% of the new RCA multi-purpose test equipment is applicable to all missiles, requiring only 20% change for each type." Besides excellent time savings boasted for the system, reductions in cost are also anticipated.

## Procurement Publicity To be Stepped Up

A revision to the Armed Services Procurement Regulation has been made that will require publicity on many more types of procurement actions than in the past.

The revision will supplant a former catch-all exemption giving "broad authority" for discretion in requiring publicity at local levels and a blanket exemption for single source procurement.

Incorporating procedures in Part 10,

Section of ASPR, Revision 52 will mean a new subparagraph (b) added to ASPR 3-807.5, emphasizing the need for competition in subcontracts awards. Policy guidance on reprocurring against defaulted contracts is also included.

The patent rights clause in ASPR 9-107.2 and the data clause in ASPR 9-203.1 have been revised to clarify policy and guarantee that license and technical fees included in contract prices will be adequately reported by contractors, with exclusion of improper or unreasonable charges.

ASPR 1955 Edition Revision 52, dated March 15, may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. at 60¢ per copy.

## GAO Would Revise Procurement Rules

General Accounting Office has recommended to the Senate Small Business Procurement Subcommittee that Pentagon Procurement rules should be revised to prevent misuse of military authority to contract with a sole source manufacturer because it is "impracticable" to obtain competition.

GAO charged that an exception to advertised bidding is being called for in many situations where it does not apply. The accounting office said that the fact that only established source

of supply is known to exist is not sufficient justification for negotiation under this exception.

GAO also criticized rules allowing Defense to place production contracts with equipment developers. GAO General Counsel J. Edward Welch said "this authorization is no less than an open invitation to award . . . contracts . . . without competition."

## New Radar Map System By Texas Instruments

A new side-looking radar that produces aerial maps thousands of miles square per hour in any weather in which man can fly has been announced by Texas Instruments, Inc.

The radar will give field commanders near-photographic, up-to-the-minute information on troop and material movements well behind enemy lines, and will pinpoint targets scattered over wide areas.

The new system fills a need for complete, detailed tactical information on a 'round-the-clock basis, penetrates camouflage, and "sees" through rain or fog with little or no distortion.

The radar adjusts perspective electronically so that items at the edge of the photograph are of the same scale as those in the center.

The system is designed for low altitude operation, and weighs only 350 lbs., including antenna. It is currently being flight tested by Texas Instruments in Dallas.

## Missile Monitor System Is Deployed in Europe

Missile Monitor, the first mobile air defense missile fire direction system, is now being operationally deployed with the U.S. Army in Europe, the Army has announced.

It will be the first operational high speed data processing electronic air defense system for missile coordination overseas. The system can detect, track and store information on large numbers of airborne targets and information on readiness and actions of air defense batteries.

According to Lt. Gen. John C. Oakes, Army's DCS/Operations, "this mobile system for our tactical forces eliminates the grease-pencil and voice-telling methods for coordinating air defense units. The field Army now has a transistorized digital control complex which permits commanders at all echelons to observe and influence the air battle."

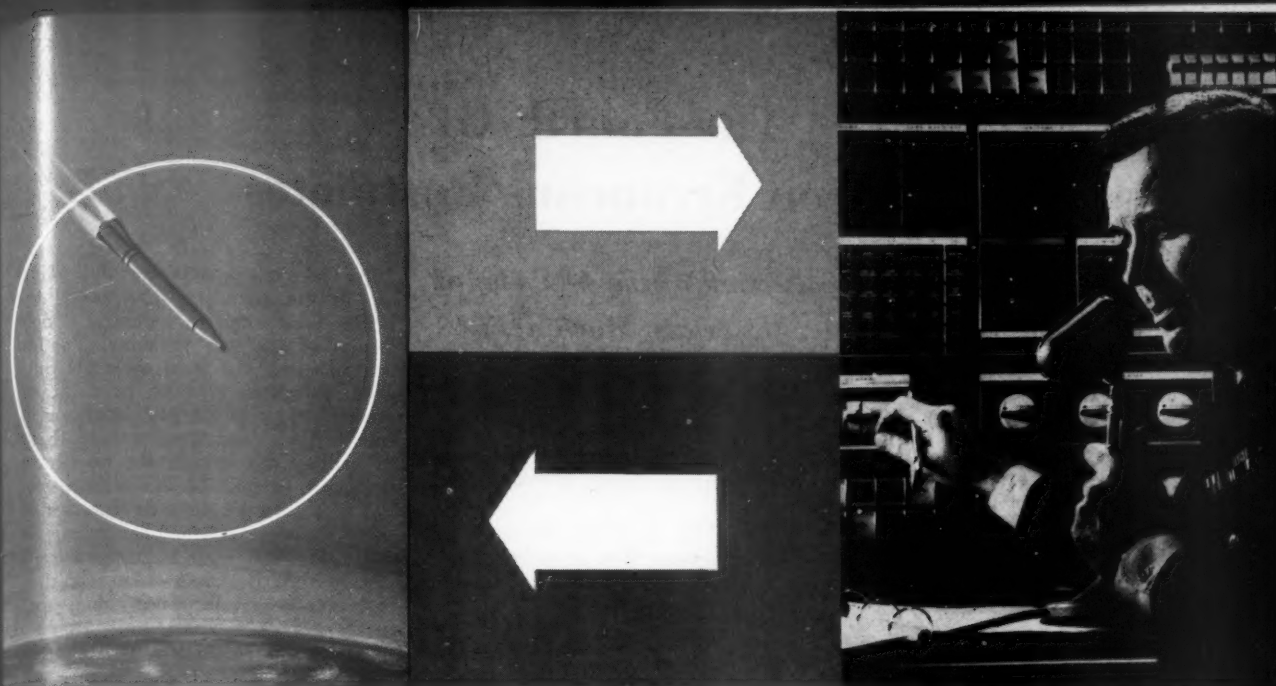
Targets are automatically tracked by Missile Monitor, while weapon assignments are flashed to missile batteries. Hawk or Nike missiles can be used in connection with the system.

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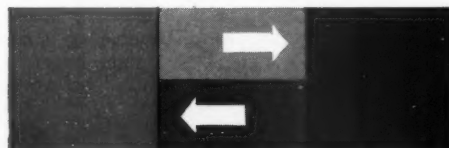
and develop complete networks to meet systems requirements. This includes, for example, data communication subsystems with message switching functions and terminal instrumentation. Message processing equipment, inquiry stations, and code modulation-demodulation equipment are already under development in the Division's laboratories.

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# The Fourth Of Fourteen Erroneous Postulates

## 4—An organization is a collection of the 4-M's being managed. (Men, Money, Materials, Machines)

by Leland B. Kuhre  
Col., USA (Ret.)

Founder and Director  
The Academy of Organizational  
Science\*

The postulate is erroneous as a starting assumption from which to form and operate an organization of collective-human-effort-for-a-purpose.

In various wordings, the 4-M generalization has age as a cliché, repetition by management, and prestige-utterance in the literature; they implant the generalization in mind with the weight of a postulate, often in unawareness. Postulates start and sustain a chain of logical deduction or intuitive reasoning; they permeate the results.

The postulate uses *machines* to include all devices to multiply human effort such as the lever, pulley, typewriter, electronic computer, gun, tank, truck, airplane, lathe, extrusion press, and so on.

The 4-M's are a class. By definition, the things in a class must be alike in some way. The 4-M's are alike as things being managed. The central meaning of *to manage* has spread to many peripheral meanings, but in a postulate it must have its central meaning—the source-concept that people sense intuitively without verbalization. The *Oxford Universal Dictionary* is designed to give source-concepts.

The first English usage of *to manage* was from the Italian, *maneggiare*, "to train (a horse) in his paces" (1561). Other similar usages followed: "to make (a weapon, instrument, etc.) serve one's purpose" (1586), "to cause (persons, animals, etc.) to submit to one's control" (1594), "to control the affairs of (a household, institution, state, etc.); to take charge of cattle" (1609), and "to bring to pass by contrivance; hence to succeed in accomplishing anything" (1722). "Persons" included slaves, serfs, bond servants, and indentured apprentices. The managed things are alike in their common property of being a commodity. In the 20th century, managing the 4-M's as a class ascribes to them the same common property.

But the Declaration of Independence in 1775 started a new concept that all men possess the power of reason with minds of their own as freeholders capable of self-government under law including the sanctity of contract. However, the pre-1775 4-M thinking prevailed into the 20th century so as to cause the U.S. Congress to declare in 1914 in the Clayton Act: "The labor of a human being is not a commodity or an article of commerce." ("Labor" had then come to mean the effort of anyone who works for wages.)

To have the 4-M's in one class today, one of the M's, Men, must be included as a pre-1775 concept, now invalid.

No relations connecting the 4-M's are in the postulate. The postulate-holder must contrive to cause a collection of the M's to submit to his control and make them serve his purpose. It follows that he must attach mental strings to the M's, singly or in combinations, and then actuate them by pulling the strings. He may have delegates to pull on his strings too, but that does not alter the fundamental situation. For example, writing in the April, 1958, issue of *Army*, a four-star general declared: "An organization does well only those things that the boss checks." The limited-to-one-mind-powered collection of the 4-M's is a chance-actuated aggregation, not a dynamical system.

But *system* has been in the core-concept of *organization* since 1790. In a dynamical (self-powered) system, all elements are connected, associated, or interdependent so as to form a complex, self-functioning unity for a definite purpose.

In summary, the postulate has within it an implicit denial of the 1775 concept of free men in a free society; and it yields a chance-actuated aggregation, not a self-functioning system which is true organization. Therefore the postulate is erroneous.

Rational postulates must contain these concepts: The material things in an organization are extensions of men to multiply their efforts. Using the force in the now commonly observed sanctity of contract, the mind of each man is both activated and freed by giving him his unique, fundamental, continuing, 'decision-contract' as his impersonal manager.

These responsible-for-and-how-discharged contracts are formed in the process of generating the system of relations which orders, connects, and governs the contracts as they call on their holders to make their respective continuing contributions of all types: executive and administrative, professional and scientific, technical and clerical, artisan and common skill. This postulated dynamical system is powered by its collective mind-power, the system-integrated totality of the system-released powers of thought, reason, and idea-creation inherent in each and every human mind in it.

\*Author Kuhre can be contacted at P. O. Box 5274, San Antonio, Tex.

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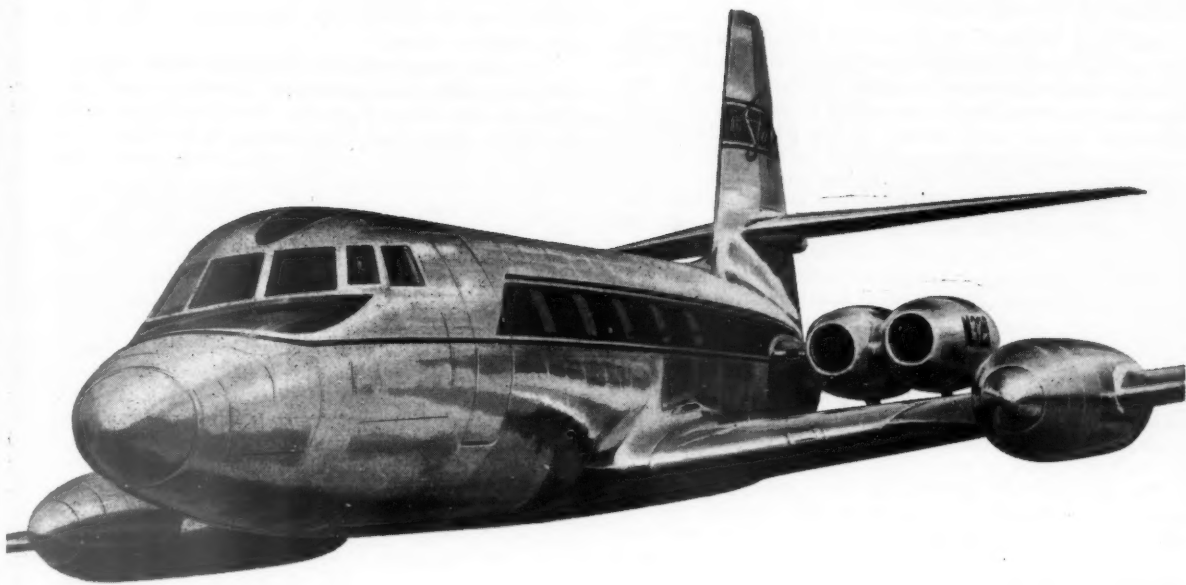
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MAY 1960



# Newsletter

Armed Forces Management Association

Washington 25, D.C. Phone: OTis 4-7193

National President: Hon. George H. Roderick

## National Conference

The Sixth National Conference of the Association was held at the Atlanta Biltmore Hotel during the period 19-21 April, AFMA's first venture outside of Washington for this important meeting. Highly successful in every way, many important lessons were learned and a pattern for future meetings established. It was decided to alternate the annual conference between Washington and a large metropolitan area such as Chicago, Detroit or New York. The 1961 meeting will be held in Washington, with the '62 gathering probably in Detroit or Chicago.

AFMA takes this opportunity to express its deep appreciation to the many distinguished speakers from Defense, industry and education who took time from their busy schedules to address the sessions. Their outstanding presentations provide a valuable contribution to the furtherance and improvement of management in the defense establishment, both through the medium of the conferees in attendance and the conference proceedings, to be published in the AFMA technical *Journal* in September.

The Association's appreciation also goes to the Commanding General of the Third Army, and his staff, without whose support the conference would not have been possible, and the many hard-working members of the Atlanta and Atlanta Depot Chapters, whose unselfish contributions of time and effort insured the success of the conference.

## National Award Winners

Highlight of the conference, as in the past, was the Awards Banquet at which recognition was given to individuals, chapters and outside organizations for their outstanding performance and superior contributions during the past year in behalf of AFMA and defense management. Making the awards was AFMA President, The Honorable George H. Roderick. Awards with recipients included:

**Achievement Award**, to the members who has made the greatest overall contribution to the work of AFMA: Col. William C. Howell, Comptroller Third Army, conference director and chapter president.

**Literary Award**, for the member making the outstanding literary contribution: J. Lewis Powell, OSD, for his "Collapse of Time" Keynote address of the '59 Conference.

**Merit Award**, the Association's highest award, to the individual who has made the greatest contribution to the improved management in the Armed Forces: The Honorable Thomas S. Gates, Jr., Secretary of Defense.

**Honorary Life Membership**, for special recognition of services to AFMA: Vice Adm. Edward W. Clextan, Chief of Navy Material; Maj. Gen. Hiram D. Ives, Chief of Staff, Third Army; Col. James L. Tarr, Director of Administrative Services, Department of the Air Force.

**Service Award**, to the organizations making the greatest contributions to the Association: the American Management Association, and the National Defense Transportation Association. Accepting the awards for their respective associations were Robert F. Steadman and Col. Frances W. Crary, USA Ret.

**Outstanding Chapter Award** plaque, to the chapter having the highest multiple score for membership growth, programming, administration and public relations: At-

Exec. Vice Pres.: VAdm. Harry E. Sears, USN, ret.

lanta Chapter, located at Fort McPherson. Col. Robert H. Shell, Third Army Adjutant General and Chapter President, accepted the award.

Tied for second place in this competition was Mohawk Chapter, Alice Lee MacHarg, President, and Chicago-Great Lakes, Robert V. Smith, President. It was noted that the latter group had been chartered less than a year in compiling its record, a truly remarkable performance.

Besides national award presentations, Corporate Member certificates were presented to General Electric Co., Wasell Organization, Inc. and J. I. Thompson Co., new industry members of AFMA, and charters were presented to representatives from newly formed chapters at Eielson Air Force Base, Alaska; Westover AFB, Massachusetts; and Travis AFB, California.

Guest speaker at the Awards Banquet, and accepting Secretary Gates' award on his behalf, was the Hon. Franklin B. Lincoln, Assistant Secretary of Defense (Comptroller), making his first public address since taking office.

Principal speaker at the Departmental Session on 20 April was the Hon. Hugh M. Milton II, Under Secretary of the Army; of the Industry Session on the 21st, Allan H. Mogensen, President of Work Simplification Conferences, Inc.; and of the Educational Institutions Session on the 19th, Dr. Edwin D. Harrison, President of Georgia Tech. Keynote speaker for the conference, whose theme was "Management's Role in the Reduction of Lead Time," was John A. Beckett, Assistant Director of the Budget, Executive Office of the President.

## Chapter Briefs

We have been asked to announce dedication dates for ten World War II U.S. military memorials and/or cemeteries for the benefit of relatives, wartime associates, and other friends of servicemen commemorated or buried therein: Luxembourg, 4 July; Netherlands (Margraten), 7 July; Henri-Chapelle (Liege), Belgium, 9 July; Ardennes (Neuvillen-Confroze), Belgium, 11 July; Brest (France), 16 July; Lorraine (St. Avold, France), 19 July; North Africa (Carthage, Tunisia), 21 July; Florence (Italy), 25 July; West Coast (San Francisco), 30 Nov.; Manila (Philippine Island), 8 Dec.

**Sacoma Chapter** got off to a flying start at its chartering meeting on 30 March. Addressing the overflow luncheon group at Offutt Air Force Base Officers' Club was AFMA Executive Vice President, Vice Adm. Harry E. Sears, USN Ret., who flew out from Washington especially for the occasion. Col. Byron K. Enyart, chapter vice president, presided in the absence of Col. Richard Temple, president.

**Chicago-Great Lakes Chapter** held its Tenth Meeting (dinner) on 15 March at NAS Glenview, Illinois. A panel composed of Capt. Rowland E. Schegel, USN, District Legal Officer 9ND, L. C. Smith, Director Industrial Training, National Safety Council, and Don L. Stanford, Director of Safety, Fifth Army addressed itself to "Management's Responsibility for Safety." Fort Sheridan was the locale for this live-wire group's next meeting, also a dinner affair, on 12 April with the theme, "Management Looks to the Sixties." Principal speakers were Thomas A. Nenzel, A.E.C., and Emmanuel L. Kohn, Department of Labor.



## Your Investment Future

### YOU CAN'T TRADE IN THE AVERAGES

Along crowded, cluttered Wall Street in downtown Manhattan the men who know stocks and bonds the best look on the publicized Dow-Jones Industrial averages as averages—nothing more.

For all the attention investors across the country might pay to these well-known averages, the figures are not to be confused with a thermometer which accurately measures the health of an individual. Whether people generally realize it or not, the Dow-Jones averages must be carefully evaluated before any sweeping conclusions are drawn.

If the stock market didn't prove anything else last year, for example, it did illuminate one fact of life to the wise old professionals. All stocks don't rise in a bull market any more than all of them decline in a bear market.

According to tabular market history, of course, 1959 will go down as a good one for the stock averages. The Dow-Jones Industrial Averages closed at 679.36, a new peak and an advance of 16.4 per cent over the final 1958 figures.

Yet it might be rather difficult to convince some investors that 1959 was a banner year for the market. Among other things, 413 listed common stocks closed on December 31 below their final 1958 quotations, 15 more showed no price change, 126 closed below their 1950 highs and almost 200 closed under their 1946 highs.

But all the same, the stocks cited above were over-shadowed by those which did show actual gains. Some 623 stocks advanced over their 1958 prices, 660 went up beyond 1950 figures and 488 different stocks registered increases over their 1946 highs.

Even so, that is little comfort to those owners of the 195 common stocks whose market quotations actually declined from 10 to 50 per cent or more in 1959, or even to those who hold any of the 218 issues which fell less than 10 per cent last year.

Under the circumstances, it is interesting to examine the Dow-Jones Averages and to see how they sometimes mask vital but little known currents in market movements. When a Wall Streeter tells another that the "market closed up three eighty-one today," for instance, he doesn't mean that stock prices advanced more than \$3.75 per share.

What he is informing his friend, who understands him perfectly, is that the Dow-Jones Industrial Average was 3.81 points higher at the close of trading than it had been 24 hours earlier. Both realize that the amount of the day's rise was determined by the sum of the net changes—gains and losses—registered by only 30 individual common stocks after that figure had been divided by an artificial divisor. The divisor is frequently changed in an effort to compensate for splits or stock dividends.

At the present time, one point in the D-J Average is equivalent to about 13.21 cents. A rise or a fall of 3.81 points, of course, would amount to just a shade over 50 cents.

As many investors know, the Dow-Jones Industrial Average is based on 30 different stocks. It might seem logical to assume that every one of these 30 stocks happens to be in the "billionaire" class, with sales or revenues or at least \$1 billion. They aren't.

Nine of the thirty stocks that make up Dow-Jones did not have sales or revenues of \$1 billion or more a year ago. But a number of stocks not included in the average have sales in excess of \$1 billion.

What's more, the fact that only 30 stocks are used casts a glare on the fact that Dow-Jones is an average—and nothing more. For with some 1,100 common stocks listed on the Stock Exchange, the issues used in the Dow-Jones Industrial account for less than three per cent of listed stocks.

For most people, the impact of the averages is plain to see. As a thermometer indicating general movements of the market for a given day or week, Dow-Jones and some other averages are helpful. But to cast an accurate focus on all the ups and downs of stocks within the market, further study is called for.

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## Today's Strategy . . .

continued from page 25

orbital object which was passing over the United States points up the requirement for such a satellite surveillance system. A surveillance system is, of course, absolutely vital to the functioning of an anti-satellite system.

**Satellite Destruction**—Some believe that the problem of satellite destruction could be solved somewhat easier than that of ICBM warhead destruction. This is based, among other things, on the fact that uncontrolled satellites travel in a highly predictable orbit, therefore an accurate forecast position can be computed. The necessity to neutralize or destroy hostile satellites of all types is obvious. The anti-satellite program should be pushed hard.

**Civil Defense**—Civil defense is not a responsibility of the military. It is, however, a subject which must not be overlooked in any discussion of national strategy.

We can judge the military value of civil defense by noting that the USSR, which attaches relatively little value to the lives of its people, has far exceeded the United States in the development of a program to protect Soviet citizens from fallout. We have failed as a nation to provide Civil Defense for our people because we view the possibility of World War III as a purely academic exercise with absolutely no chance of it becoming reality. No other unemotional reason can explain the total indifference to our basic survival. If this reasoning is in error . . . ?

This series of articles has explored a new military philosophy designed for our nuclear age, and adjusted to the new fact that our enemies can retaliate as "massively" as we.

Many of the decisions and priorities involving the ICBM, Polaris, Carriers, Post Attack Reconnaissance, B-70, Fixed ICBM's, Satellites, Satellite Detection, Satellite Destruction, F-108, VTOL/STOL, and Airborne Alert, were predicted upon the now infeasible policy of massive retaliation.

If present policies in the Defense Department continue, our future security will depend *primarily* on long range

ballistic missiles that cannot attack mobile targets. The enemy will inevitably make his long range missile force mobile—as we have done with the Polaris and are planning to do with Minuteman. When we are faced with mobile Russian rockets, vertical take-off aircraft and aircraft of unlimited range, what must our answer be?

Without the means to attack mobile Russian missiles, and other mobile forces, the U.S. will be reduced to military impotence.

We may have some rockets that can destroy cities and people—but against the threat of superior Russian forces they will prove inadequate for a military contest, and even more inadequate for any contest of mutual retaliation.

ICBM's cannot, by themselves, protect those nations which we have sworn to protect. They cannot, by themselves, protect the U.S. They cannot by themselves, achieve a military victory or even stalemate. Alone and unsupported by weapons other than conventional aircraft of limited range they could only invite their own initial destruction or provoke the ultimate destruction of our own people.

On the other hand, dispersed and mobile forces, on the surface or at various altitudes, could guarantee an ultimate military victory. Only such a guarantee can keep an aggressive enemy at bay. We must now develop anew our demonstrable ability to attack and destroy a military threat if we are to continue to resist such threats. This can be done.

No one of these systems which are recommended will provide a complete answer. Progress and technology will show that some should be abandoned while others should be pursued. The important fact which applies to all proposals in the development of future systems and strategies is that progress must be made toward solving the problem of countering and destroying the enemy's military threat. We can marshal our resources to this end—but only after we shift the course of our planning from the present dead end street of deterrence through suicidal terror to deterrence by demonstrable military superiority.

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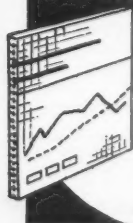
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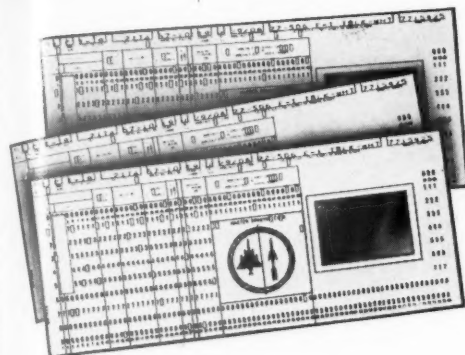
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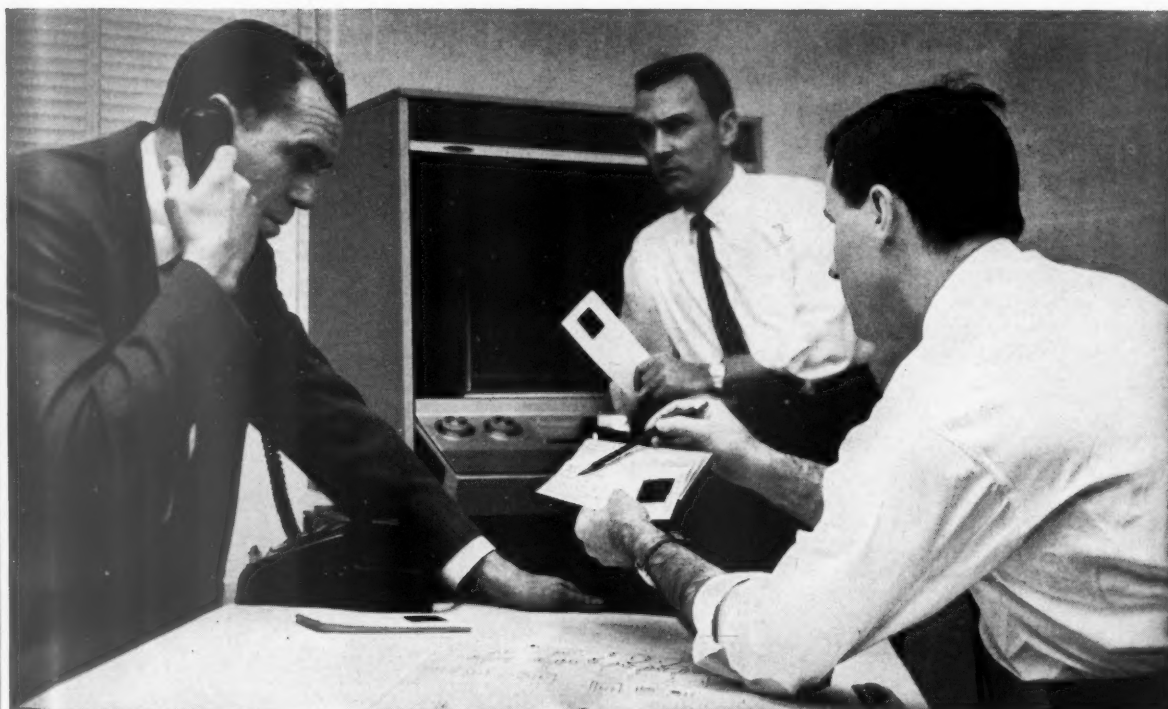
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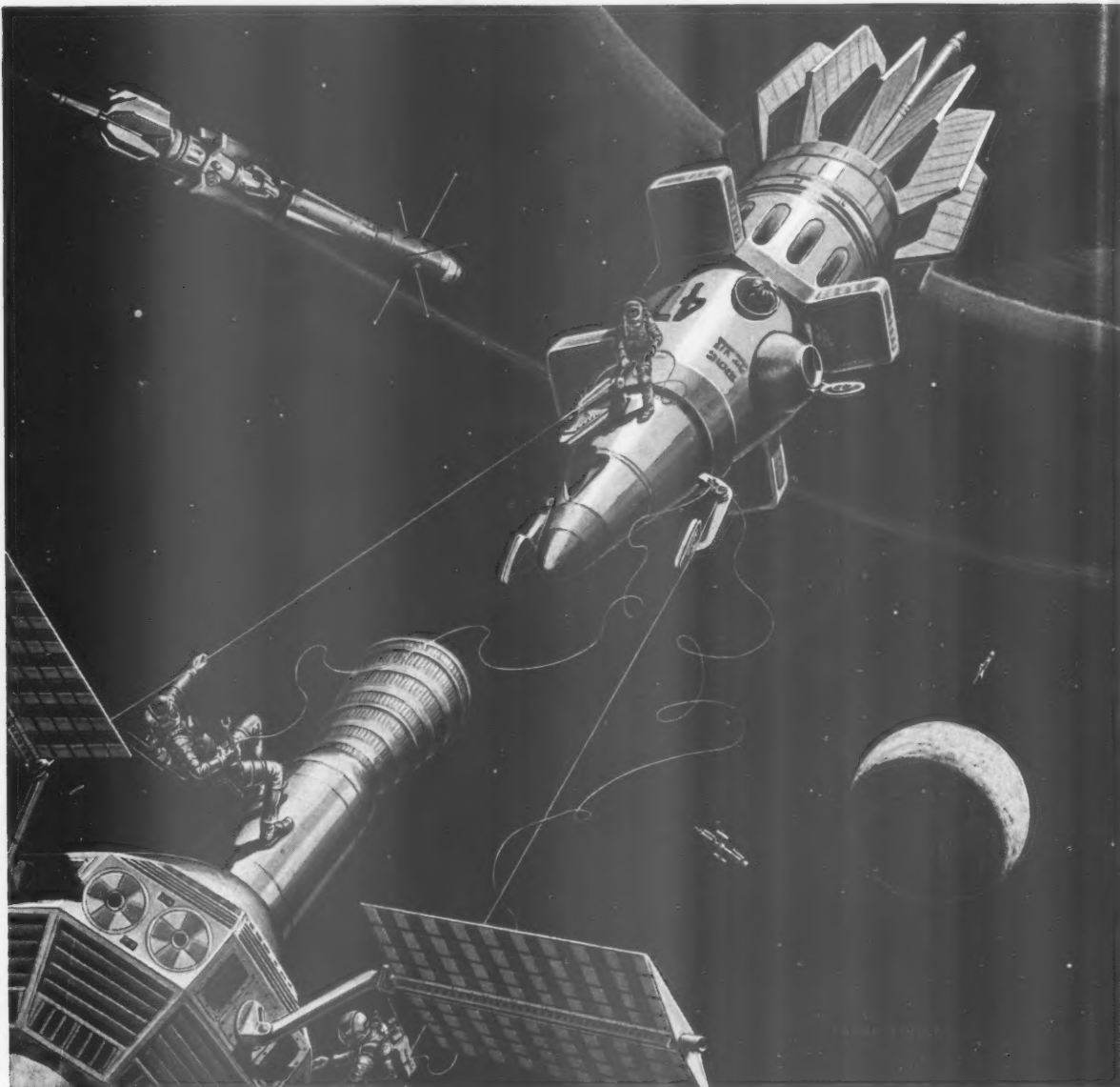
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STEPS IN THE RACE TO OUTER SPACE

## *Breaking a Space Traffic Jam*

By 1970 our solar system will be filled with expended satellites—whirling aimlessly in space with dead batteries and electronic equipment, their missions long since completed.

As space traffic increases, these derelicts will have to be captured and broken out of orbit to keep flight paths clear. For this task, special towboats will be designed and crews trained.

Here, step by step, is an account of such satellite capture and destruction:

1. The towboat, driven by electro-particle propulsion, rockets into space at speeds reaching 25,000 m.p.h. Its reversible engines enable it to slow as it approaches

the radar-located satellite, and match the derelict's speed as it moves into orbit behind it.

2. Crewmen attach lines to the satellite (as in illustration). Then they haul the towboat forward and its nose cone is clamped to the satellite's rocket nozzle.

3. The towboat's engines are then switched to full reverse and the linked machines gradually lose momentum, nosing into a spiral path toward the Earth below.

4. When a safe point is reached, the towboat automatically releases the satellite and it is consumed by friction as it

plunges into the heavier atmosphere. The towboat, regaining its speed, moves on to its next assignment—breaking a traffic jam in some other congested point in space.

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